Zeagle®
SYSTEMS, INC.

IMPORTANT: Read about the Octo-Z's **Bi-Annual**
Visual Inspection / Service Schedule
Item 4.2 on Page 6

p/n 320-7200

Regulator Service Manual

For Zeagle Octo-Z Regulator/Inflator
Manual p/n 347-3020, Copyright 2008

This Service manual uses signal words recommended by the American National Standards Institute (see ANSI Z535.4) to designate levels of hazard seriousness. These signal words and their designations are as follows:

DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Octo-Z Parts

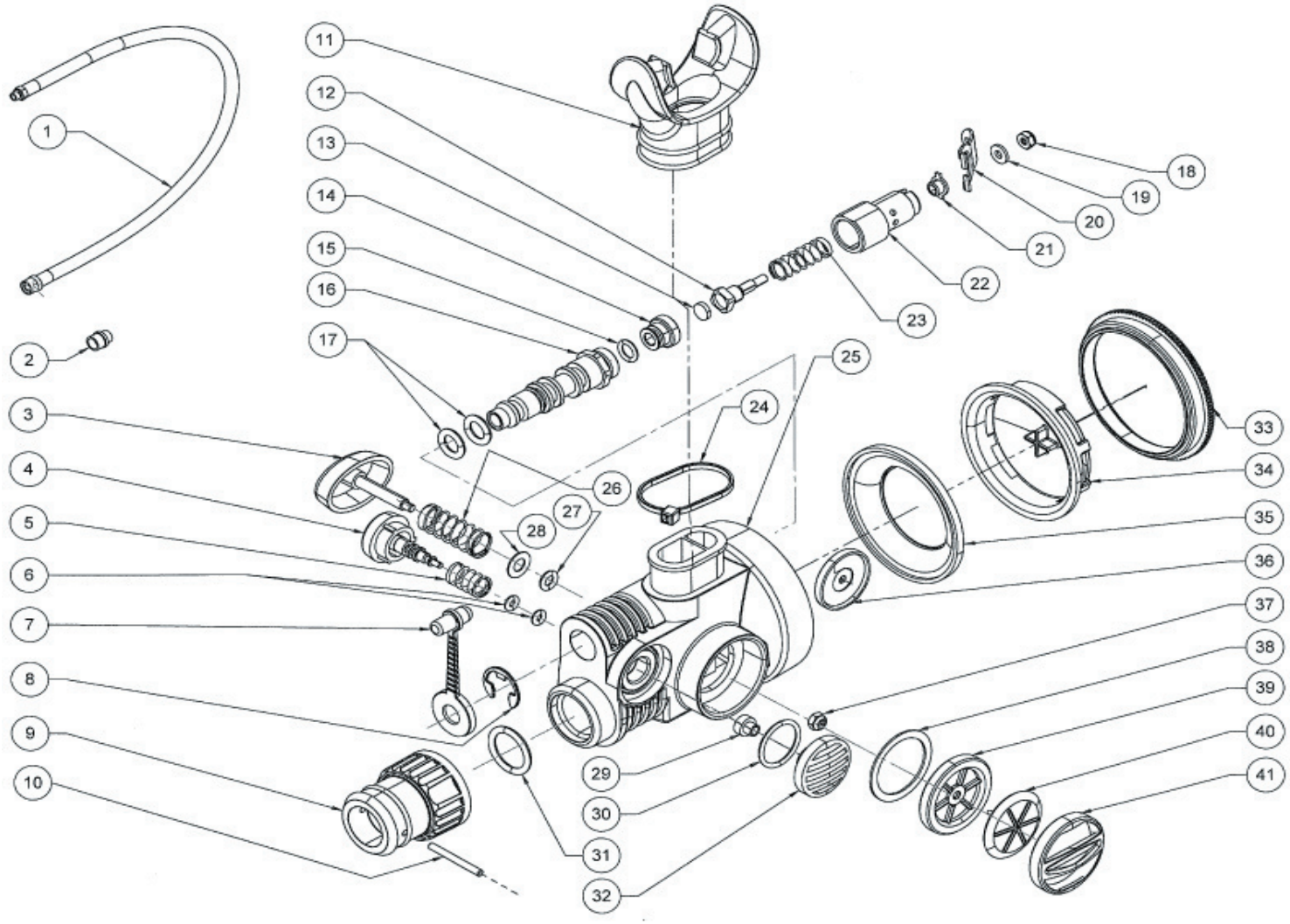
ITEM #	PART #	DESCRIPTION.....
1	165-1127	Inflator HOSE Complete (27”)
2	342-7241	QD Fitting (attaches to any Scuba 2nd Stage Hose)
3	342-7216-AY	Oval BUTTON (Yellow)
3	342-7216-AK	Oval BUTTON (Black)
4	342-7226-AY	Round BUTTON (Yellow)
4	342-7226-AK	Round BUTTON (Black)
5	342-7227-VH	SPRING (for Round Button)
6*	160-2819-N7	O-Rings for Round Button Shaft (2 needed)
7	342-7232-LK	PLUG (for male QD fitting)
8	342-7233-VH	CIR-CLIP
9	342-7234-AA	COUPLING Assembly (for Corrugated Hose)
10	342-7236-VH	Stainless PIN
11	342-5201-MU	MOUTHPIECE
12	342-7209-CD	POPPET
13*	342-7208-MK	SEAL
14	342-7207-CD	SEAT (orifice)
15*	160-1110-N7	O-ring (for Seat)
16	342-7205-CD	QD TUBE
17*	160-0109-N7	O-ring (for QD Tube)
18	342-7215-AA	NUT
19	342-7214-VH	Stainless WASHER
20	342-7213-VH	LEVER
21	342-7212-KA	Stem COLLAR
22	342-7211-CD	LEVER SUPPORT
23	342-7210-VH	SPRING (for Poppet)
24	111-4001	Plastic TIE
25	342-7203-KY	BODY (Yellow)
25	342-7203-KK	BODY (Black)
26	342-7217-VH	SPRING (for Oval Button)
27*	160-4502-N7	O-ring (for Oval Button Stem)
28	342-7218-VH	Stainless WASHER (for Oval Button Stem)
29	342-7229-AA	Sealing NUT (for Inflate Button)

Zeagle
Octo-Z
Model: 320-7200YL (Yellow)
Model: 320-7200BK (Black)

* An asterisk next to the Item Number means that part is included in the Standard Service Kit. The Service Kit Part # for the Octo-Z is 345-7000.

Octo-Z Parts (continued)

ITEM #	PART #	DESCRIPTION.....
30*	160-0017-N7	O-ring for Inflate Cover (32)
31*	160-0114-N7	O-ring for Corrugated Hose Coupling (9)
32	342-7231-KA	Inflate COVER
33	342-7240-BK	Cover RING
34	342-7239-LK	Purge COVER
35	342-7237-AA	DIAPHRAGM
36	342-7220-AA	Selector VALVE
37	342-7215-AA	NUT
38	342-7222-KA	Flat GASKET
39	342-7223-KA	Valve SUPPORT
40	342-7224-MA	Exhaust VALVE
41	342-7225-KA	Valve GRATE



zeagle SYSTEMS, INC.

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Before You Begin .....
Read these instructions completely before you begin servicing the regulator. These instructions are intended for people who have been AUTHORIZED by Zeagle to repair Zeagle Scuba equipment. If you are not so authorized - STOP.

SERIAL NUMBERS
The letter at the beginning of the serial number on Zeagle Regulators indicates the regulator model. For example, if the serial number begins with “A” it is a DS-V non-swivel first stage (e.g. A001324). “B” is a 50D swivel turret first stage, “C” is an Envoy first stage and “Z” is an Octo-Z Reg/Inflator. For further information, contact Zeagle.

1.0 INTRODUCTION

1.0.1 The procedures in this manual apply to Zeagle Scuba Regulators. Refer to the exploded view as you read the service section of the manual. The Item Numbers referred to in the service section are those seen in the exploded view

! WARNING !

NEVER reuse the main diaphragm in a diaphragm FIRST stage. A used diaphragm will not clamp securely as required. A used main diaphragm may come loose during use, causing a severe regulator malfunction. This is true with all diaphragm first stages. Failure to heed this warning may result in serious injury or death.

! WARNING !

NEVER tighten the hose fitting to a first stage with more than 40 in. lbs. (4.5 Nm) of torque. The inlet hose fitting will be weakened by over tightening. Failure to heed this warning may result in serious injury or death.

NOTE: All Zeagle Scuba Regulators have service kits available which contain the parts which must be changed at every annual service no matter what their condition. The standard annual service kit part numbers are shown in the parts list. All other parts not contained in these kits must be inspected by the technician and changed under warranty only if they have failed due to problems with material or workmanship.

! WARNING !

Zeagle Scuba Regulators are manufactured using materials suitable for use with oxygen enriched gases (i.e. Nitrox, etc.) providing the oxygen content does not exceed 40%. Equipment intended for enriched air (Nitrox) use must not be used with regular compressed breathing air, or other gases. Regulators intended for enriched air use can be serviced only by technicians trained by one of the major oxygen enriched air training agencies. Failure to heed this warning may result in serious injury or death.

1.0.2 This manual gives breakdowns of regulator parts, equipment specifications, servicing instructions, troubleshooting recommendations, and guidelines for proper care of Zeagle Octo-Z regulators. This manual is intended for use only by persons specially trained and authorized to service Zeagle Scuba equipment.

1.0.3 Anyone attempting to service or repair Zeagle Scuba regulators must have a thorough understanding of the principles of operation of scuba regulators and valves, as well as the appropriate mechanical ability. The technician must be properly trained in the safe use of compressed air and the various tools and cleaning solutions involved in the procedures outlined in this manual.

1.0.4 The best source for current part numbers for any of the parts listed in this manual is your current parts and price list from Zeagle. The best source for Service PROCEDURES though, is a SERVICE MANUAL like this one.

1.0.5 Zeagle conducts seminars on a regular basis to train technicians in proper service and repair procedures for all current Zeagle regulators. In addition, all Zeagle dealers and their staff members are encouraged to attend the seminars to gain an in-depth understanding of the construction, special features and operation of Zeagle regulators. For information on the dates and locations of upcoming Zeagle service seminars near you, contact Zeagle or a Zeagle Sales Representative. Pending Technical Seminars are often listed on the “Contact Zeagle” page at www.zeagle.com .

NOTE: You must be authorized by Zeagle to work on Zeagle Scuba equipment. You can obtain proper authorization by attending all appropriate seminars given in your area. This is the only way you can become an authorized Zeagle technician.

1.0.6 If you have any questions, or need more information, contact your Zeagle Scuba Sales Representative or Zeagle Customer Service. You can e-mail you technical questions to tech@zeagle.com

2.0 SPECIFICATIONS

Model, Zeagle Octo-Z, p/n 320-7200-BK (black), p/n 320-7200YL (yellow)

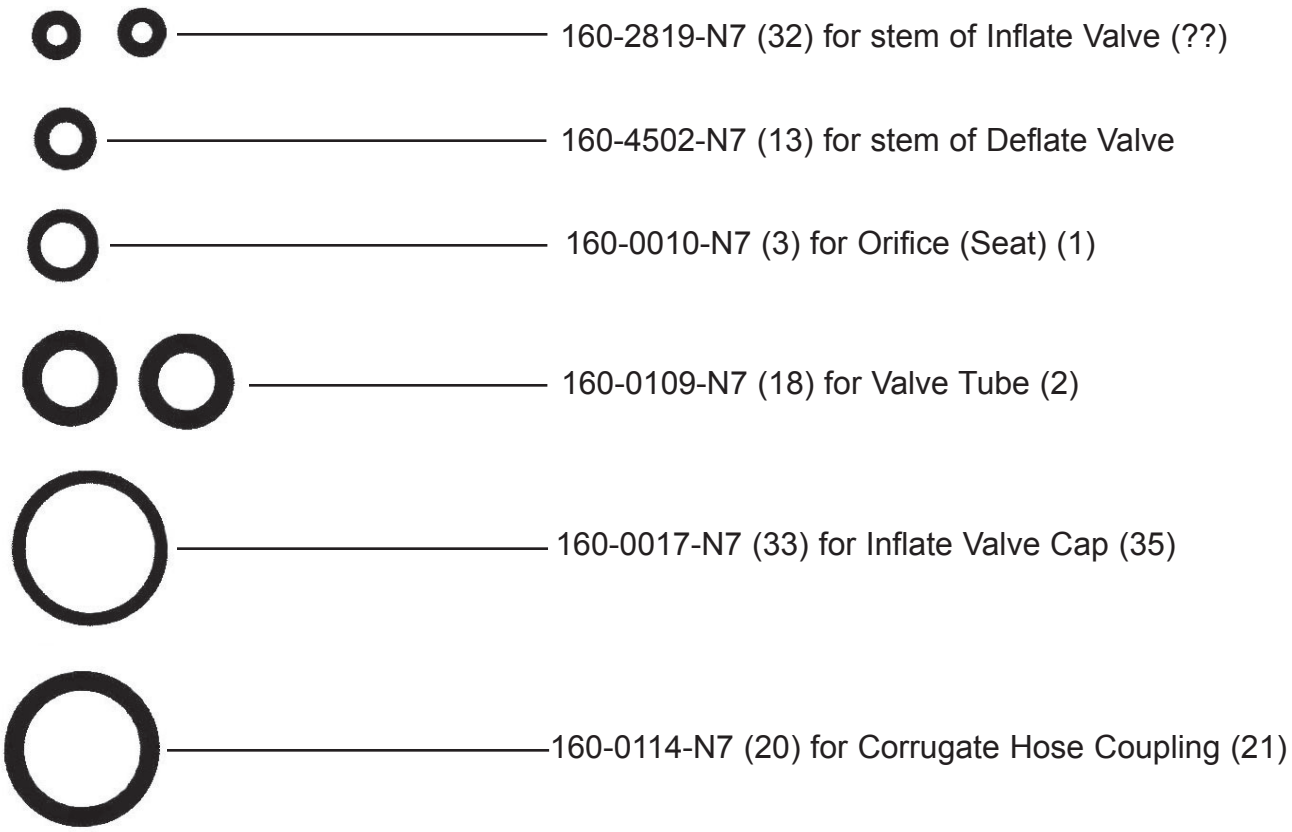
AIR FLOW	33 cu. ft. (935 liters)/min. @ 1 atmosphere
INHALATION RESISTANCE ...	0.9” -2.0” (2.3 - 5.08 cm) w.c. @ 1 atmosphere (adjustable)
EXHALATION RESISTANCE ..	0.6” (1.52 cm) w.c. max. @ 1 atm.
INFLATION RATE	10 cu. ft/min at 150 psi inlet and 1 atm. bladder pressure
RECOMMENDED LUBRICANT	LTI Christo-Lube 111®

TYPE	Downstream, diaphragm activated poppet valve. Combination Inflator and Safe Second Regulator
WEIGHT.....	Body .5 lb. (.23 kg) (w/o hose) Hose .45 lb. (.20 kg) (hose only)
HOSE LENGTH	26 in. (406 mm)
MATERIALS	Cover ----- Flexible Thermoplastic Case ------ Rigid Thermoplastic Poppet Seat ---- Advanced Elastomer O-rings - Buna-N Diaphragm ------ Elastomeric Polymer Exhaust Valve-Thermoplastic Elastomer Mouthpiece ---- Silicone

2.1 Zeagle Scuba Regulator Model Numbers:

Model #	Description
350-1110	Flathead-VI Yoke 1st stage, with ZX 2nd Stage - 30” Hose
350-1121	Flathead-VI DIN 1st stage, with ZX 2nd Stage - 30” Hose + DIN to Yoke Converter
350-2110	50D (swivel turret), Yoke 1st stage with ZX 2nd Stage - 30” Hose
350-2121	50D DIN 1st stage, with ZX 2nd Stage - 30” Hose + DIN to Yoke Converter
350-4110	DS-IV Yoke 1st stage with ZX 2nd Stage - 30” Hose
350-4121	DS-IV DIN 1st stage with ZX 2nd Stage - 30” Hose + DIN to Yoke Converter
350-3110	Envoy Yoke 1st stage with Envoy 2nd Stage - 30” Hose
350-3121	Envoy DIN 1st stage, with Envoy 2nd Stage - 30” Hose + DIN to Yoke Converter
350-5110	Envoy Yoke 1st stage, with Envoy DELUXE 2nd Stage - 30” Hose
350-5120	Envoy DIN 1st stage, with Envoy DELUXE 2nd Stage - 30” Hose
350-5121	Envoy DIN 1st stage, with Envoy DELUXE 2nd Stage - 30” Hose+ DIN/Yk Convter
350-5210	ReZort Yoke 1st stage, with Envoy 2nd Stage - 30” Hose
350-5220	ReZort DIN 1st stage, with Envoy 2nd Stage - 30” Hose
350-5221	ReZort DIN 1st stage, with Envoy 2nd Stage - 30” Hose + DIN to Yoke Converter
350-6240	RaZor (Reg/Valve) 1st stage, with Envoy 2nd Stage - 48” Hose
320-1110	2nd stage only, ZX Octopus 2nd Stage, with yellow cover - 36” hose
320-1115	2nd stage only, ZX 2nd Stage, with gray cover - 30” hose
320-3115	2nd stage only, Envoy 2nd Stage, with gray cover - 30” hose
320-3110	2nd stage only, Envoy Octopus 2nd Stage, with yellow cover - 36” hose
320-7200BK	Octo-Z, Regulator / Inflator Combination (color Black)
320-7200YL	Octo-Z, Regulator / Inflator Combination (color Yellow)
310-1110	1st stage only, Flathead-VI Yoke
310-1120	1st stage only, Flathead-VI DIN
310-2110	1st stage only, 50D (swivel turret), Yoke
310-2120	1st stage only, 50D (swivel turret), DIN
310-4110	1st stage only, DS-IV (non-swivel), Yoke
310-4120	1st stage only, DS-IV (non-swivel), DIN
310-3210	1st stage only, Envoy, Yoke
310-3220	1st stage only, Envoy, DIN
310-5210	1st stage only, ReZort, Yoke
310-5220	1st stage only, ReZort, DIN
310-5210	1st stage only, ReZort, Yoke
310-6230	1st stage / Valve Combo, RaZor Brass, 3/4” Tank Inlet Thread
310-6232	1st stage / Valve Combo, RaZor Aluminum, 5/8” Tank Inlet Thread
330-0001	DIN to Yoke Converter (allows a DIN equipped regulator to be mounted on a Yoke Valve with no tools.)

O- Ring Identification Page
(O-rings included in Kit # 345-7000)


160-2819-N7 (32) for stem of Inflate Valve (??)
160-4502-N7 (13) for stem of Deflate Valve
160-0010-N7 (3) for Orifice (Seat) (1)
160-0109-N7 (18) for Valve Tube (2)
160-0017-N7 (33) for Inflate Valve Cap (35)
160-0114-N7 (20) for Corrugate Hose Coupling (21)

Print this page out, so you can lay the O-rings from Kit 345-7000 on the page for easy identification.

4.0 SERVICE PROCEDURES FOR THE ZEAGLE Octo-Z

4.0.1 Before you begin disassembly of the Octo-Z, attach it to a 1st stage and test it for function and leaks . Pre-testing in this way will help the technician to pinpoint any specific problems requiring repair.

4.0.2 The work area must be clean and well lighted, with a tub of clean fresh water to test for leaks and clean compressed air to blow sand and dirt from parts.

4.1 TOOLS & ITEMS REQUIRED FOR Octo-Z SERVICING

- Soft-jawed bench vise (bench vise with rubber, plastic, aluminum or plastic jaw inserts)

- 1/4” Nut Driver (available from hardware store)

- 3/16” Allen wrench (p/n 347-0316)

- 6” or 8” good quality adjustable wrenches for hose connections.

- Needle Nose Pliers

- Annual Service Kit p/n 345-7000

- Clean Shop Rags

- LTI Christo-Lube 111® (p/n 347-.0111) or Silicone Grease

- Intermediate Pressure Testing Gauge

4.2 ALTERNATING BI-ANNUAL SERVICE & INSPECTION PROCEDURES for the Octo-Z

It is important for the technician to understand that the Octo-Z alternates between the Bi-Annual Visual Inspection and the Bi-Annual Service/Overhaul. On the 1st anniversary of the sale of the Octo-Z, a Visual Inspection and Leak Test is performed (See Section 5.0). On the 2nd anniversary of the sale the Octo-Z is disassembled, cleaned and overhauled with new service kit parts (See Section 6.0). There is a log in the back of the Octo-Z Owner’s Manual, to keep track of which procedure is due for the regulator. If the owner cannot remember which procedure is due and the technician has no record, then revert to the Service/ Overhaul Procedure in Section 6.0.

IMPORTANT: The purpose of the Visual Inspection Procedure is to determine that the Octo-Z is physically OK and is operating properly. This insures that the Octo-Z is able to give another year of good service to the owner. During this inspection it is important to understand that ANY parts that fail due to DEFECTS in materials or workmanship discovered during this visual inspection will be covered under the warranty. However, if the inspection is done properly, no 345-7000 Service Kit parts will be used and therefore parts in this Service Kit will not be replaced free of charge during the Visual Inspection Procedure, unless those parts have FAILED due to defects in materials or workmanship.

A flat cost for the visual inspection procedure should be given to the customer before starting. It is advisable to establish a maximum cost point for any unexpected but needed non-warranty parts replacement that results from the visual inspection. If this cost point is exceeded, then the customer should be notified before proceeding.

5.0.0 VISUAL INSPECTION PROCEDURE

5.0.1 Visually inspect the exterior of the Octo-Z and its inflator hose, looking for cracks, tears or defects in the materials that would negatively affect the function of the Octo-Z. If any are found that are not warranty related, inform the customer that the affected parts will have to be replaced.

5.0.2 Detach the Octo-Z from the Bx Corrugated Hose connection and attach it to the inflator hose QD fitting. Open the tank valve to apply the proper 120-149 psi (8.2-10.2 Bar) to the Octo-Z. Immerse the Octo-Z and QD into a pan of water. Look for bubbles showing leaks at sealing points holding back intermediate pressure. See Photos 1 & 2 for critical locations to observe.

5.0.3 Clean out any debris seen inside the Octo-Z when the Cover/Diaphragm Assembly is removed.

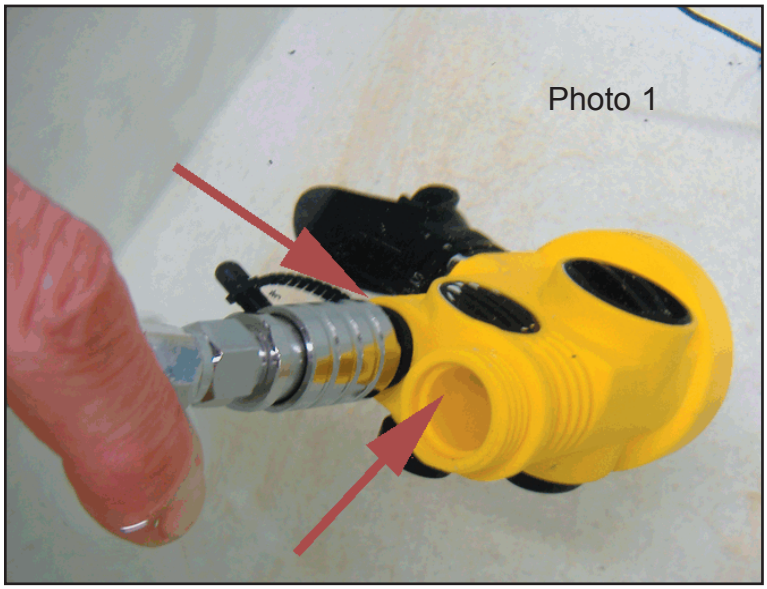


Photo 1

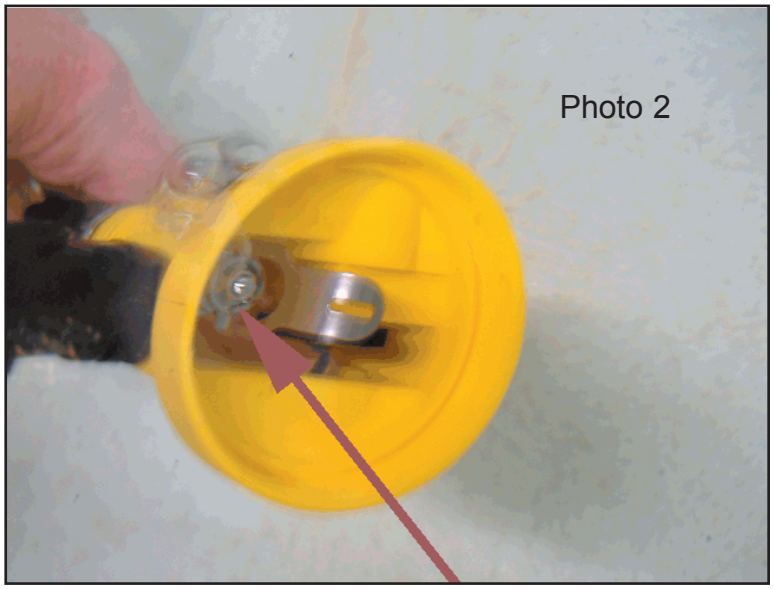


Photo 2

5.0.3.1 Sometimes the cover can be difficult to remove. If the Cover Ring (33) cannot be turned by hand even after running hot water for several minutes over the body, try inserting a slim screwdriver under the cover through two of the side vents as shown in Photo 2B below. **Carefully** turn the cover and ring counter-clockwise and the cover should come loose.

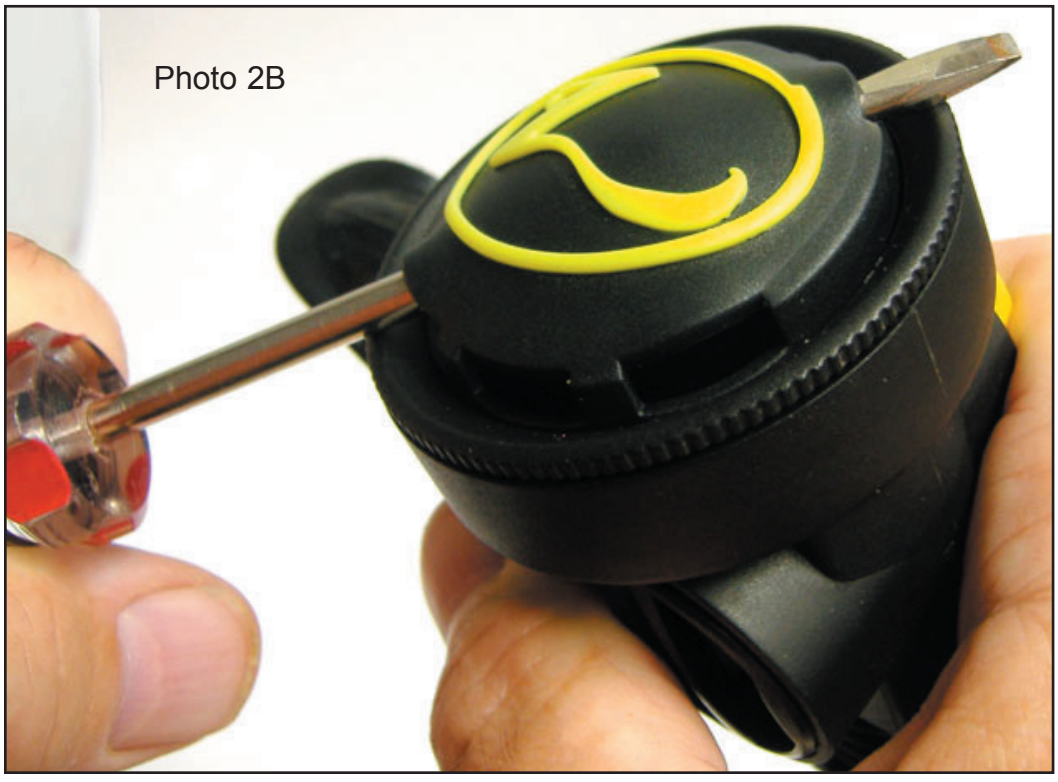


Photo 2B

5.0.4 Replace the Purge Cover Assembly onto the Octo-Z.
5.0.5 Attach the Octo-Z to a BC using the Bx Coupling.
5.0.6 Orally inflate the BC with the Octo-Z by putting the mouthpiece in the mouth and exhaling while depressing the oval Deflate/Oral Inflate Button. Release the button between breaths. Check for smooth quiet action of the oval button.
5.0.7 With the mouth removed from the mouthpiece, push the oval Button and watch for proper deflation of the BC.
5.0.8 Attach the Inflator Hose to the Octo-Z using the QD Fitting.
NOTE: It is always good practice to connect and disconnect QD Fittings when there is no positive pressure in the hose. O-Rings and Seals will have a shorter life, if connection and disconnection is done under pressure.
5.0.9 Open the tank valve to apply 125-150 psi to the Octo-Z through the Inflator Hose.
5.0.10 Push the round Inflate Button until the BC is fully inflated and the OP Valves release some air. Feel and listen for any unusual sounds or rough feel when the button is depressed.
5.0.11 Immerse the Octo-Z fully in the pan of water and look for any escaping bubbles from the stem seal of the Oval Button, the stem seal of the Round Button, the Inflate Valve Cap, the QD Fitting, or the Bx Corrugated Hose Coupling. See the arrows in Photos 3 & 4 for these locations.

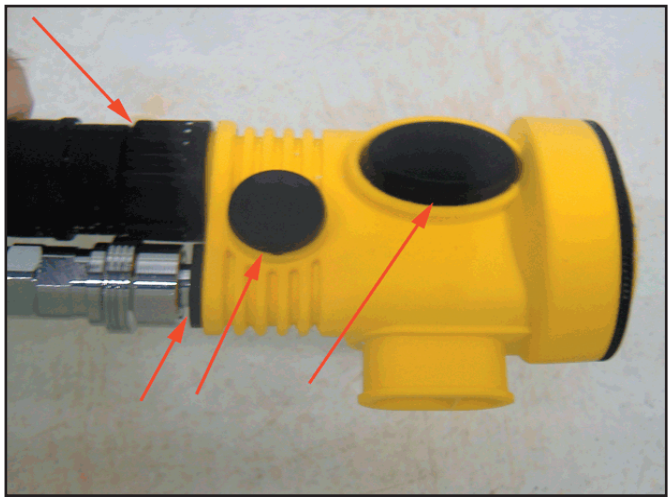


Photo 3

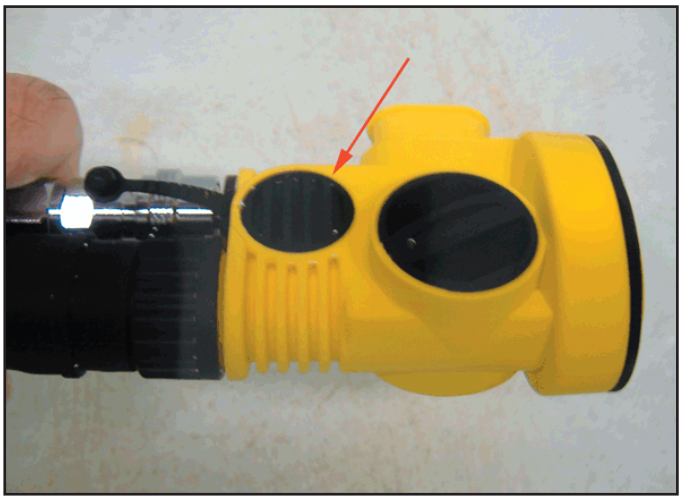


Photo 4

5.0.12 Inspect the mouthpiece for tears or missing tabs.
5.0.13 Take a few breaths from the Octo-Z to determine that the inhalation is smooth and easy. It is not necessary, but if a gauge is used to measure inhalation effort, it should be between 1.5” and 2.1 “ of water column. Remember that the Octo-Z spends most or all of the dive out of the diver’s mouth, so it should be adjusted with a higher cracking effort than a primary regulator to avoid unintentional free flows caused by water currents particularly during water entry.
5.0.14 Clean easily removed dirt from the exterior of the Octo-Z with an old tooth brush.
5.0.15 Push the round Inflate button and the Purge cover to remove most of the moisture from the interior of the Octo-Z
5.0.15 Use clean compressed air to dry the Octo-Z exterior.

5.0.16 Note: If the Octo-Z did not exhibit any problems during the visual inspection, then the procedure is finished and the Octo-Z cab be returned to the customer. If minor problems are found, they can be corrected during this inspection. If major problems are found, then the technician should revert to the full overhaul procedure section of this manual. Be sure to instruct the customer that this has been a visual inspection and that at the next annual period, the full tear-down, inspection and overhaul will take place. At **that** time (during the bi-annual full service interval), parts in the 345-7000 Service Kit will replaced no matter their condition at no cost to the owner **IF** they are the original owner, bought it at an authorized Zeagle Dealer and have it serviced/ inspected annually. The 345-7000 Kit is not provided for the bi-annual Visual Inspections. If the procedure has to revert to a tear-down session during the Visual Inspection, ONLY parts that have FAILED due to faulty workmanship or materials will be replaced at no cost through the provisions of the limited Lifetime Warranty.

6.0 Octo-Z FULL SERVICE PROCEDURES

Note: Unless the Octo-Z has failed, or problems were discovered during the bi-annual Visual Inspection, the following Full Service Procedure is to be conducted only on the 2nd year and then every other year after that.

The procedures covered in this manual section apply to the Octo-Z regulator/inflator. See the picture on the front page of this manual to identify this model type. The serial number for this model always starts with “Z”. The number can be seen on the front curved section of the body, below the oval Deflate Button. It starts with the letter “Z” and is followed by a six digit number.

6.1 DISASSEMBLY OF THE Octo-Z

To view the complete parts list of the Octo-Z, at the inside front cover of this manual if it is printed, or the third page if you are viewing this as a PDF.

6.1.1 Disconnect the Octo-Z body assembly from the Corrugated Hose Coupling Assemble (9) and the Fill Hose (1) and QD Fitting (2)

6.1.2 Remove the O-ring (31) from the corrugated Hose coupling (9) and replace it with one from the Service Kit.

6.1.3 Remove the mouthpiece (11) by cutting the two mouthpiece ties (24) with side cutting pliers. Discard the old mouthpiece ties. Examine the condition of the mouthpiece. Pay particular attention to the area on top just behind where the old ties tightened. This is a prime area for small holes to develop. If the mouthpiece is in good condition, it can be reused.

6.1.4 Use a slotted screwdriver to loosen and remove the Inflate Valve COVER (32) from the BODY (25).

6.1.5 Hold the round Inflate BUTTON in place with one finger, while loosening the Sealing NUT (29) with a slotted screwdriver (See Photo 5)

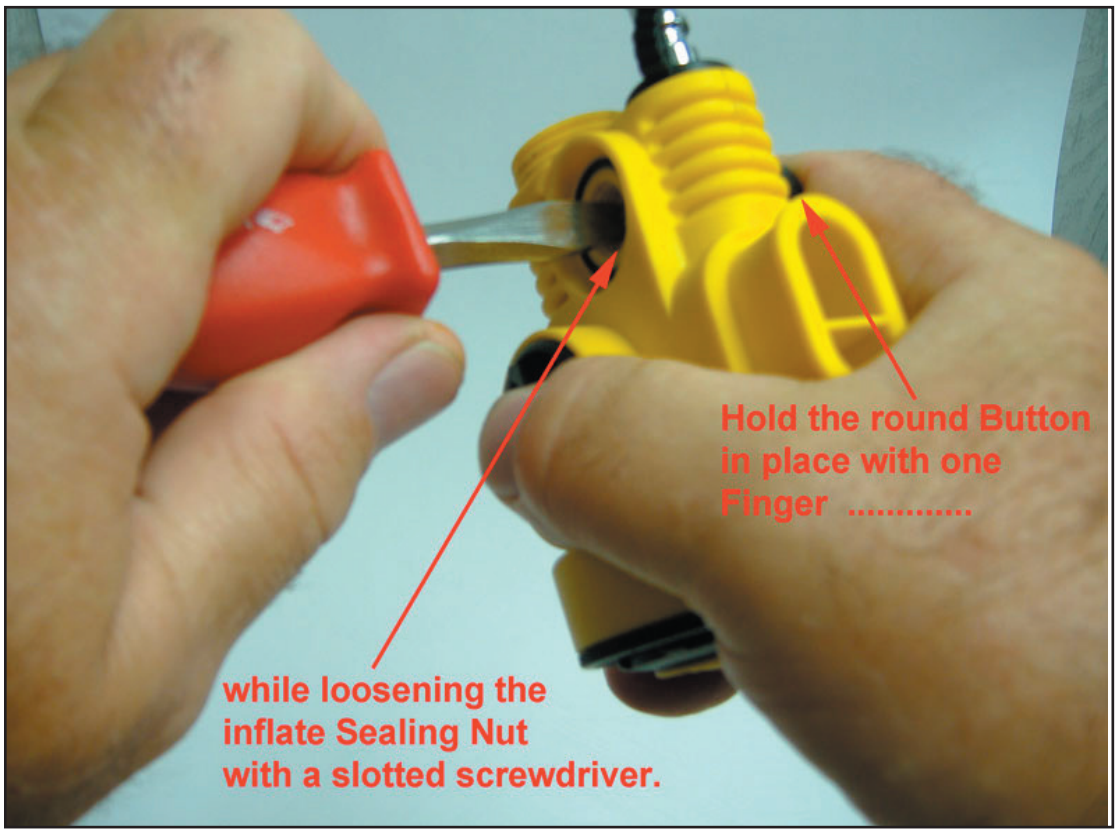
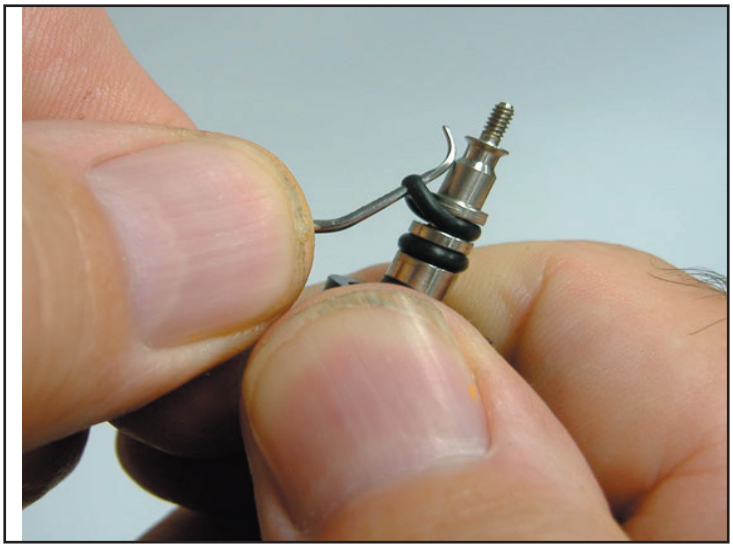


Photo 5

6.1.6 When the NUT (29) is disengaged from the threads of the Inflate Shaft (4), remove the Inflate BUTTON assembly (4), and SPRING (5), from one side of the BODY (25) and the NUT (29) from the other side. The NUT (29) with its rubber seal can usually be reused. Remove the O-ring (30) from the BODY (25).

6.1.7 Carefully remove the two O-rings (6) from the grooves in the Inflate BUTTON assembly (4). Take care not to scratch the grooves while removing the O-rings or a constant leak from the inflate stem will result. (See Photo 6)

Photo 6



6.1.8 Remove the Valve GRATE (41) from the BODY (25) by turning the GRATE counter-clockwise.

6.1.9 Temporarily flip the edges of the EXHAUST VALVE (40) to expose the legs of the Valve SUPPORT (39) underneath. Use your fingers or needle nosed pliers to turn the Valve SUPPORT counter-clockwise until it is out of the BODY (25). (See Photo 7)

6.1.10 Unscrew the Cover RING (33) and remove the Purge Cover (34) and DIAPHRAGM (35). If the Cover RING is difficult to remove even after soaking in hot water, try slipping a long thin Screwdriver under the face of the Purge Cover through the slots in the cover and turning the whole cover assembly counter-clockwise.

Photo 7

6.1.10 Remove the flat GASKET (38) from the BODY (25). The GASKET will be re-used.

6.1.11 Hold the oval Deflate BUTTON in place with one finger, while loosening the NUT (37) with a 1/4" nutdriver (See Photo 8)

6.1.12 When the NUT (37) is disengaged from the threads of the Deflate Shaft (3), remove the Deflate BUTTON assembly (3), and SPRING (26), from one side of the BODY (25) and the NUT (37) from the other side.

6.1.12.1 Unscrew the Cover Ring (33) and remove the Purge Cover (34) and Diaphragm (35). It the Ring is too tight, see Step 5.0.3.1 on Page 7.

Photo 8

6.1.13 The Selector VALVE (36) is removed from the BODY (25) by passing it through the opening that usually holds the Front Cover. (See Photo 9). For later reassembly, notice when you remove it that it is properly oriented when the silver imbedded washer is facing up.

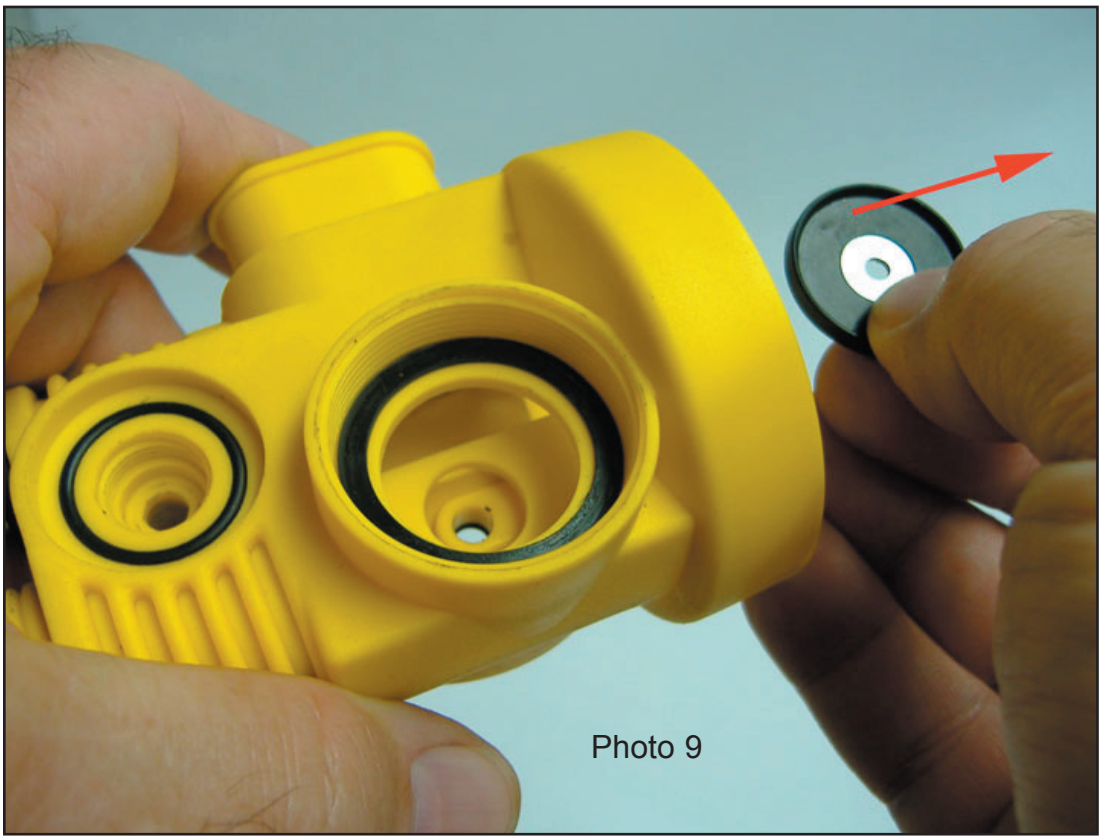
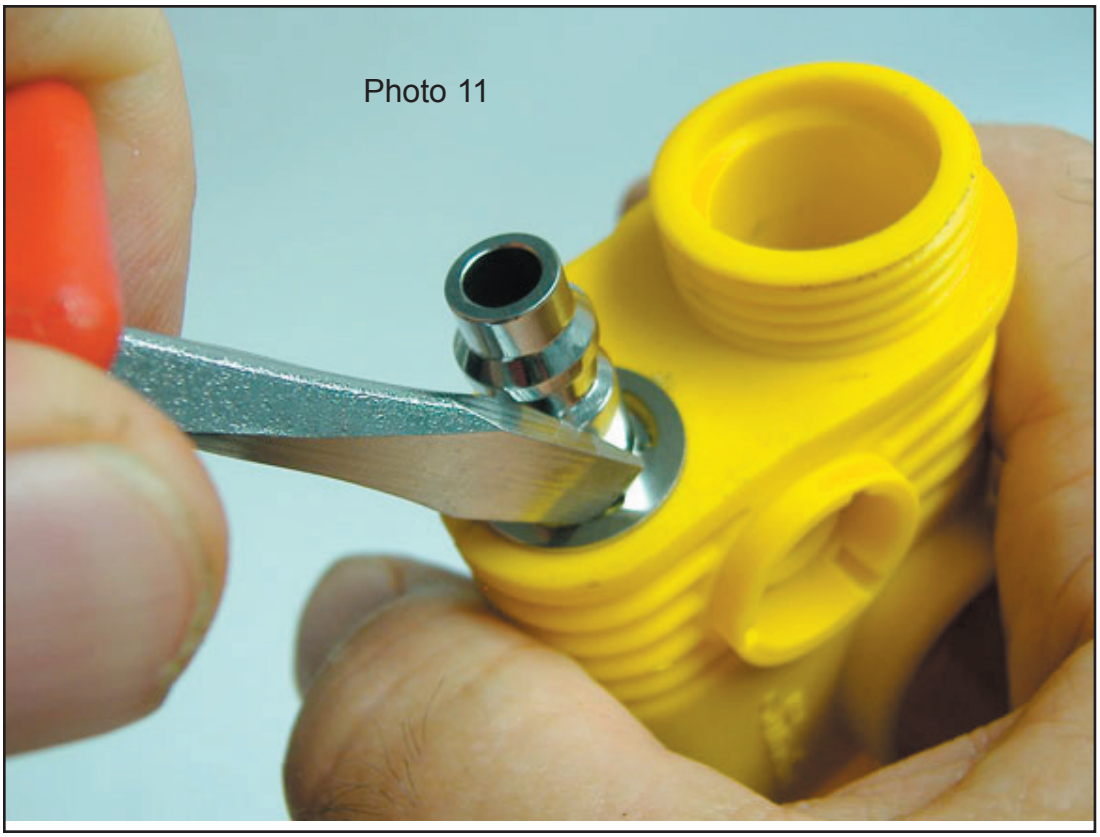


Photo 9

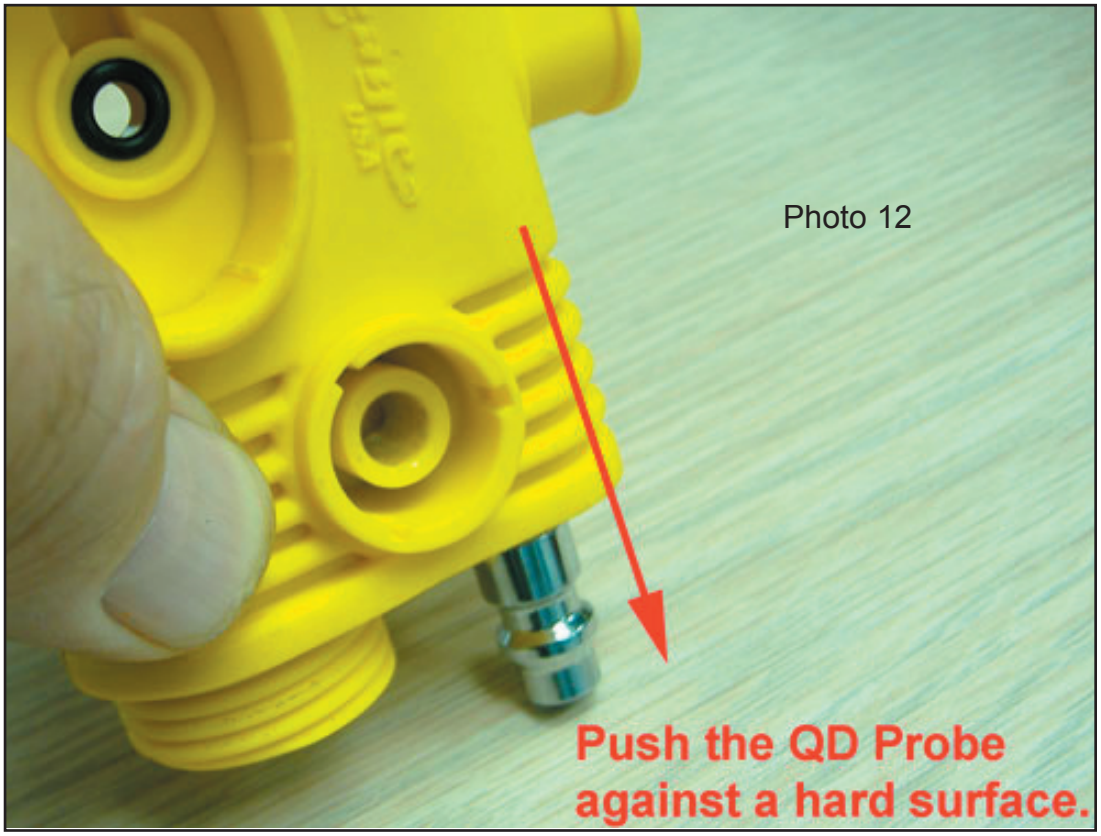
Photo 10

6.1.14 Remove the QD PLUG (7) by carefully pulling it free with your fingers. (See Photo 10)

6.1.15 Use a flat bladed screwdriver to remove the Cir-Clip (8) that holds the QD Tube (16) in the BODY. (See Photo 11)

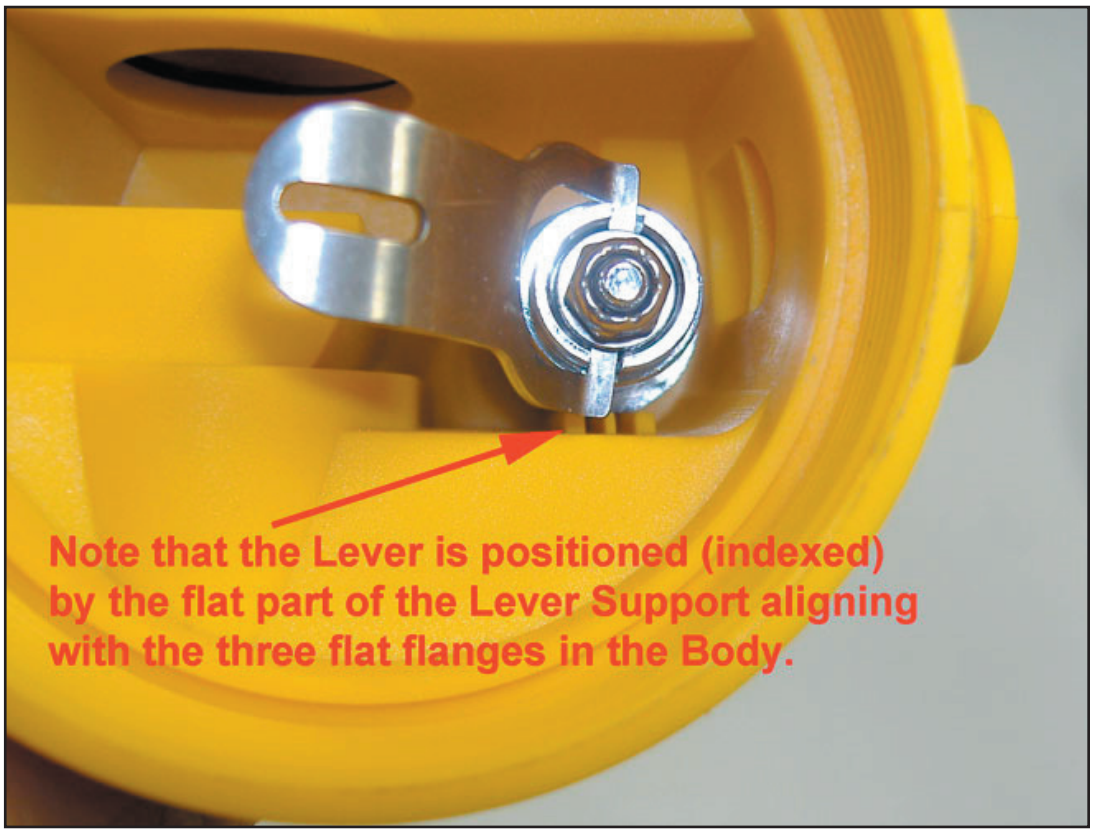


6.1.16 To remove the QD Tube (16) assembly from the BODY (25), push the tip of the QD against a hard surface. (See Photo 12)



6.1.17 While removing the QD Tube, look into the open end of the body and notice that the Lever (20) is indexed into its proper position by engaging the flat part of the Lever Support (22) with three raised flanges in the Body that form a flat ledge for the Lever Support. Keep this positioning in mind when you reassemble the Octo-Z. (See Photo 13)

Photo 13


Note that the Lever is positioned (indexed)
by the flat part of the Lever Support aligning
with the three flat flanges in the Body.

6.1.18 When you have removed the Valve Tube Assembly from the BODY (25), unscrew the two sections of the Valve Tube Assembly to expose the Seat (orifice)(14). (See Photo 14)

Photo 14

6.1.19 Use a 3/16” Allen Wrench to remove the Seat (14) from the Lever Support (22). Carefully remove the O-ring (15) from the Seat taking care not to scratch the O-ring groove in the process. (See Photo 15)

Photo 15

6.1.20 Carefully remove the O-rings (17) from the QD Tube (16) (See Photo 16)

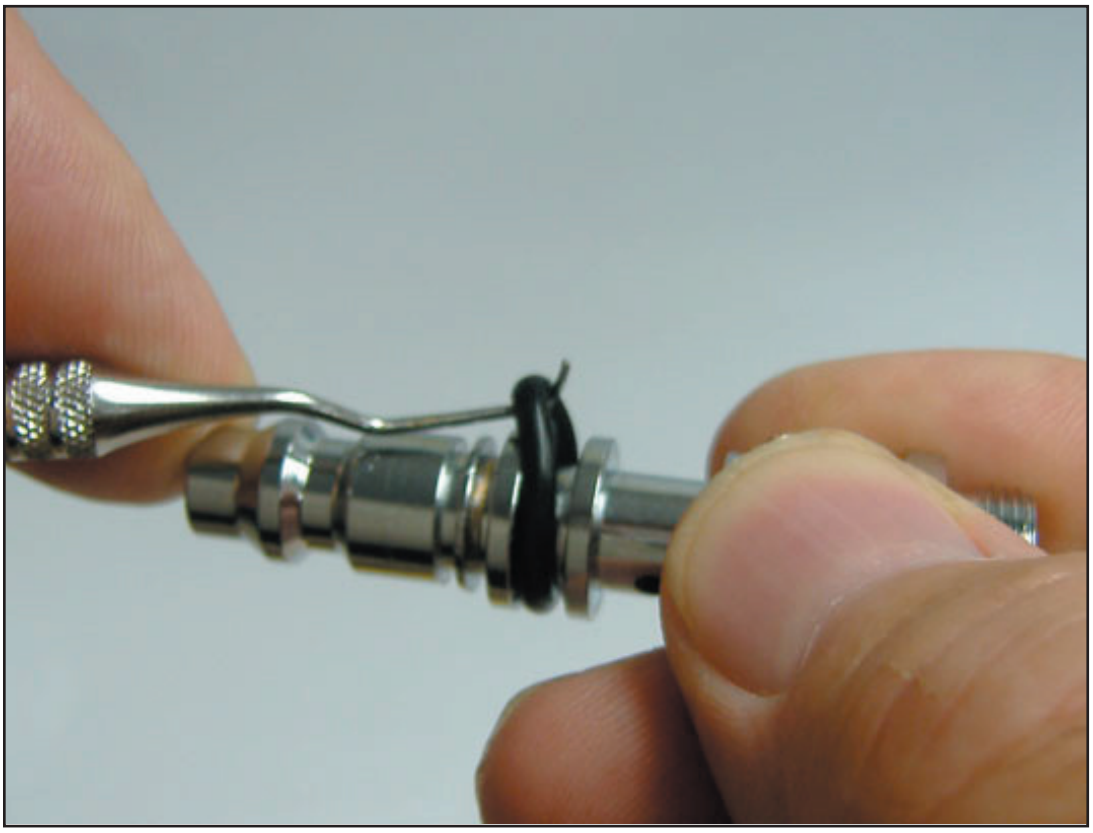
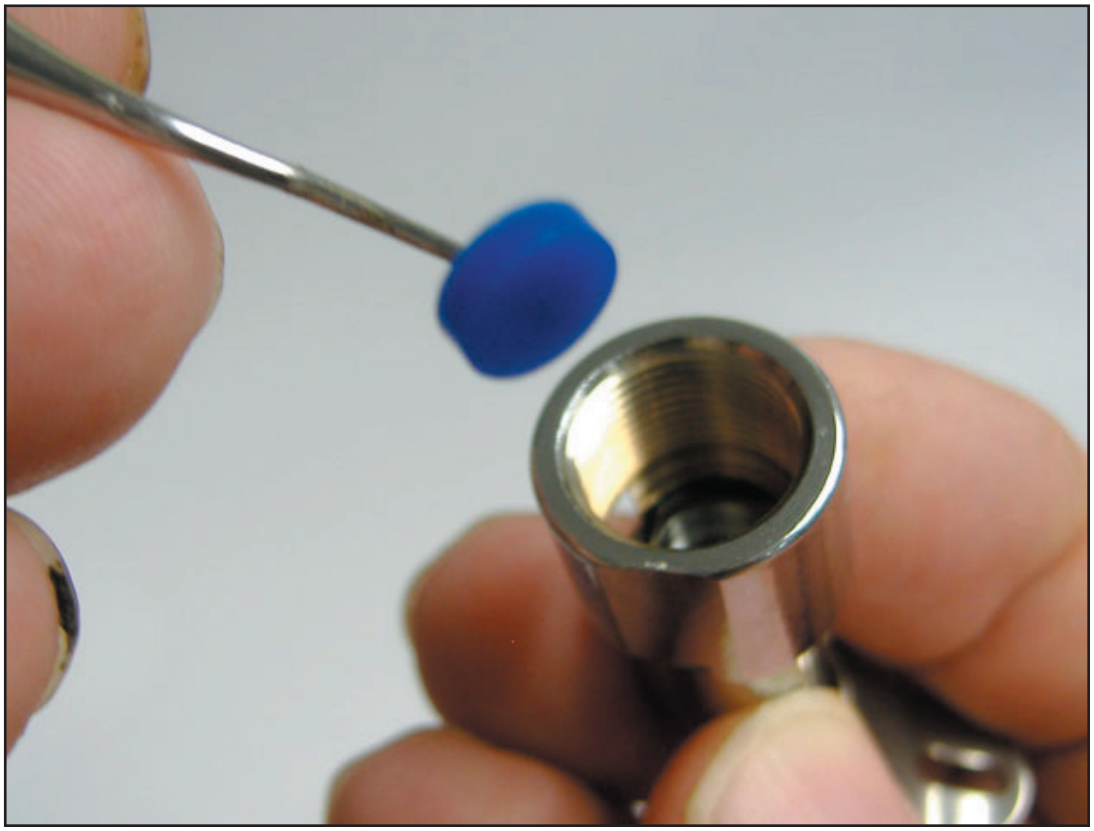


Photo 16

6.1.20 Use a sharp pick to pierce and remove the Seal (13) from the Poppet (12). (See Photo 17)

Photo 17



6.1.21 **DO NOT DISASSEMBLE THE LEVER SUPPORT ASSEMBLY BEYOND THIS POINT! (See Photo 18)**

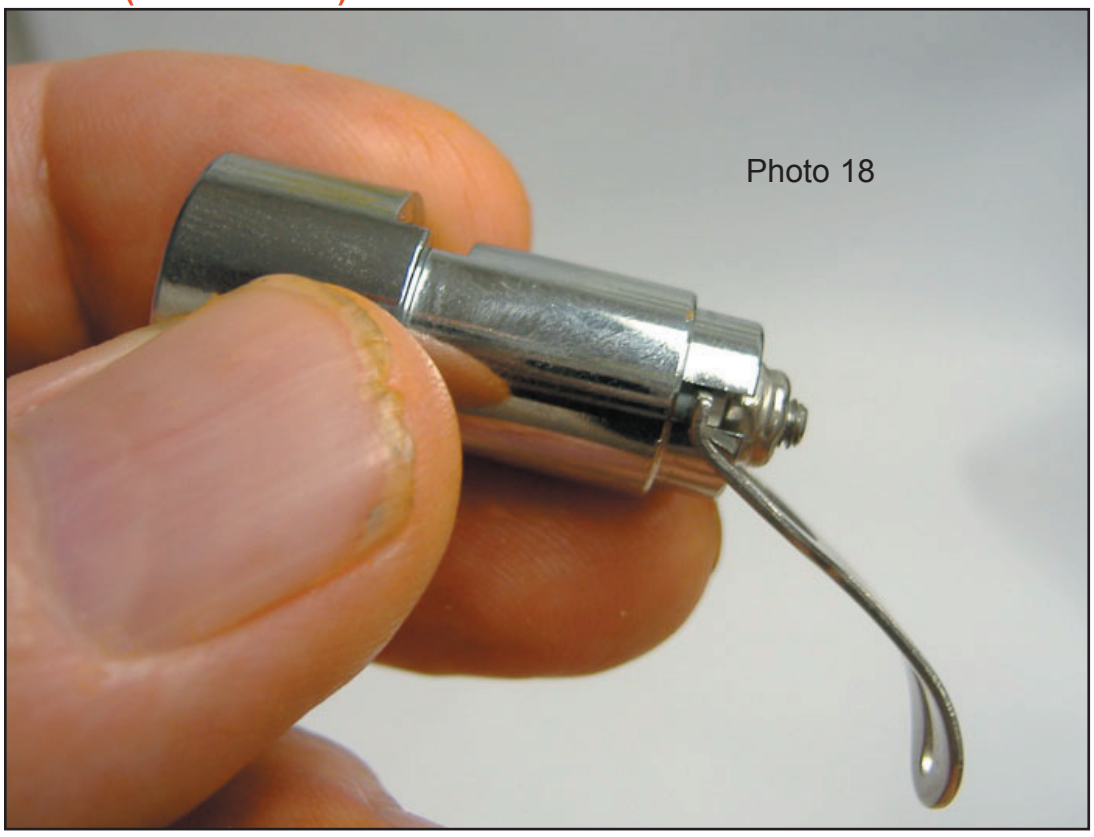


Photo 18

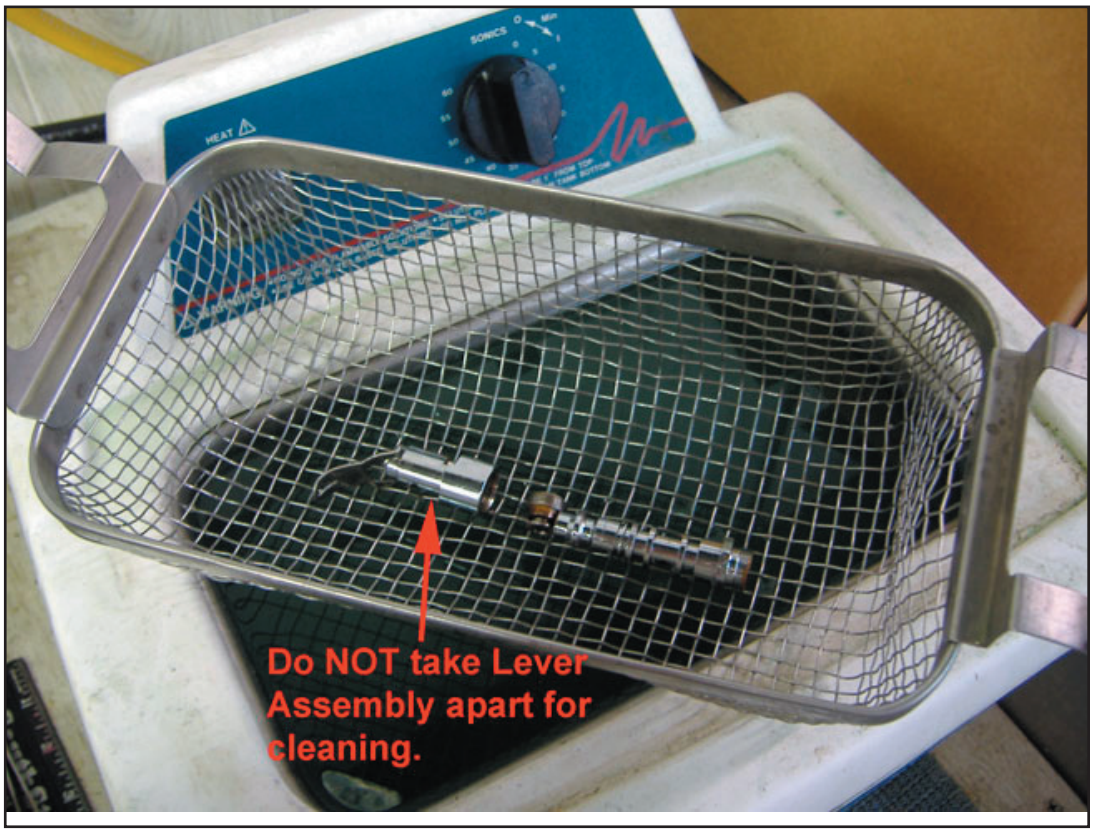
To make the technician's job much easier, it is important to avoid processes that are very time consuming, but do not contribute to the overhaul. The Lever Assembly as shown in Photo 18 at right, is time consuming to reassemble and adjust if the NUT (18) is removed from the POPPET (12). Once the Seal (13) is removed from the Poppet (12), the whole Lever Support Assemble can be cleaned in the Ultrasonic Cleaner. This avoids unnecessary time being spent on the overhaul process.

6.2 CLEANING AND INSPECTING THE Octo-Z

6.2.1 Rinse all plastic and silicone parts in fresh warm soapy water solution. Rinse with clean warm water and then blow the parts dry with compressed air to remove any sand and dust particles.

! WARNING ! **DO NOT** use vinegar or other acid solutions on the plastic parts since this will cause the plastic to become brittle!

Photo 19



6.2.2 If necessary because of deposits or corrosion, clean all metal parts of the Octo-Z in an ultrasonic cleaner or cleaning solution (See Photo 19). See Section 10.1 for recommendations on cleaning solutions.

6.2.3 Inspect the Body (25) for any cracks or nicks. Look particularly closely at the area where the exhaust valve (14) seals and where the bushing (8) clamps. Replace the housing if any cracks are found.

6.2.4 Inspect the sealing surface on the Seat (14), where the seating seal (13) seals, for any nicks or scratches. Replace the seat (14) if any serious defects are found at the sealing area, or if the threads appear worn out. Simple corrosion due to poor rinsing by the owner can be removed with an old toothbrush.

6.2.5 Blow all dust and debris out of the Seat (14) (also known as the orifice) with clean compressed air.

6.2.6 Inspect the exhaust valve (40) and the Valve Support (39). Look carefully at the base of the barbed nipple where it comes out of the middle of the valve. Look for any tearing at this point. Replace the valve if any tears are found. Replace the valve if nicks or tears are found at the sealing edges of the valve.

6.2.7 During the Bi-annual Overhaul, all parts included in the Annual Service Kit (345-7000) are replaced no matter what the condition of those parts. Carefully examine all other parts of the Octo-Z for signs of deterioration. Replace those parts too where necessary

7.0 PRELIMINARY ASSEMBLY OF THE Octo-Z

7.0.1 Ensure that all parts are clean. To determine the identity of each O-ring in the Octo-Z Service Kit, remove them from the bag and use the O-ring Identification Chart by printing out page 5 of this manual. After Printing the O-ring Identification page, lay each O-ring over its corresponding picture on the page and read the description.

IMPORTANT: Before installing new O-rings into the Octo-Z, lightly lubricate them with LTI Christo-Lube 111®.

7.0.1 Install a new Seal (13) from the Service Kit into the end of the Poppet (12) that is still in the Lever Assembly, using a flat probe such as the 1/4" dowel shown in Photo 20 below.

Photo 20

7.0.2 Install a new lubricated O-ring (15) onto the Seat (14) and then use the 3/16" Allen Wrench to install and screw the Seat into the Lever Assembly until it bottoms gently onto the Seal you just installed into the Poppet. (See Photo 21)

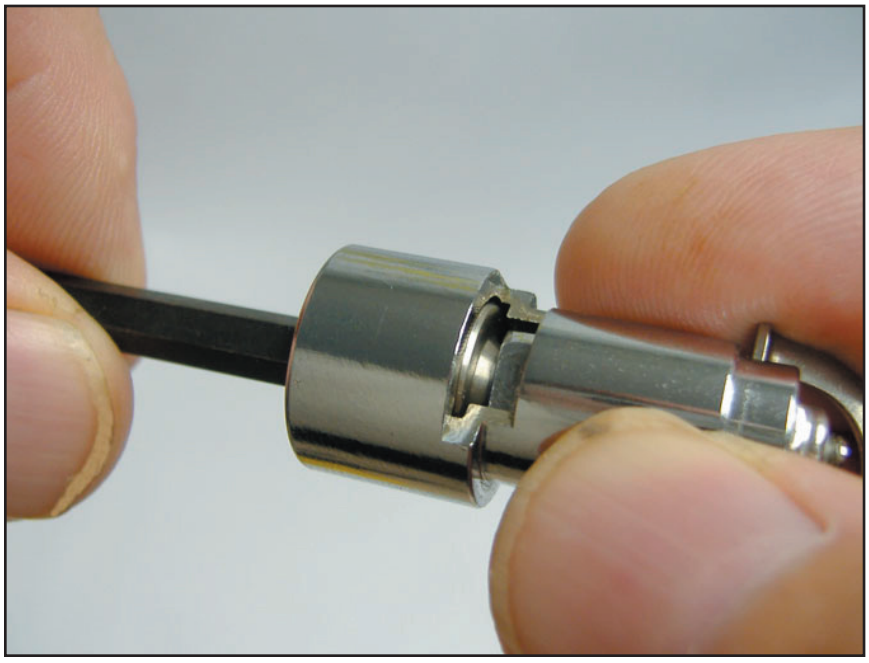


Photo 21

7.0.3 Install new lubricated O-rings(17), onto the QD Tube (16) and then screw the QD Tube into the Lever Support (22). Screw the two sections together until they are hand tight. This positioning will allow the assembly to slide properly into the Body (25). (See Photo 22)

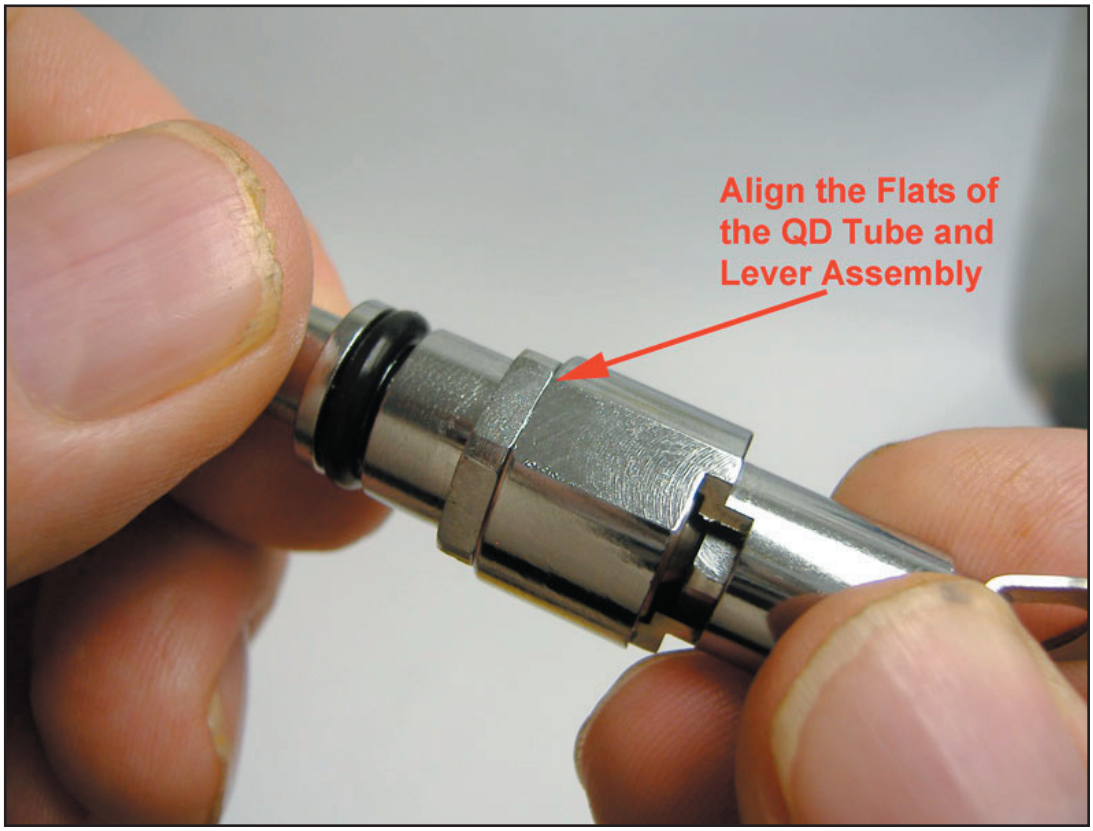


Photo 22

7.0.4 Insert the Lever/QD Assembly into the body. As you are inserting the Assembly, carefully line up the flat on the Lever Support (22) so that it slides into position over the three raised flat flanges. This indexes the position of the tip of the Lever (20) properly in the Body (25).

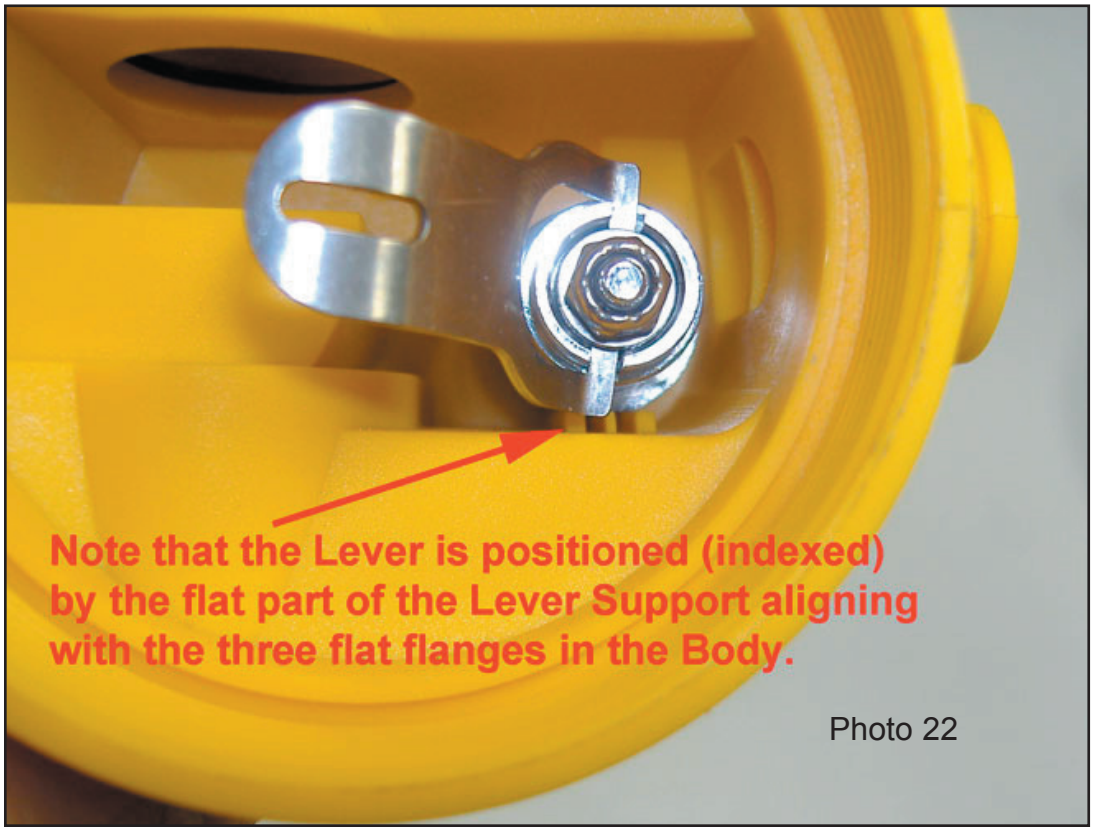

Note that the Lever is positioned (indexed)
by the flat part of the Lever Support aligning
with the three flat flanges in the Body.

Photo 22

7.0.5 Install the Cir-Clip back into the proper groove on the QD Tube (16) using a flat bladed screwdriver. There are two groove on the QD Tube, The Cir-Clip must be installed into the groove farthest from the tip of the QD fitting. (See Photo 23)

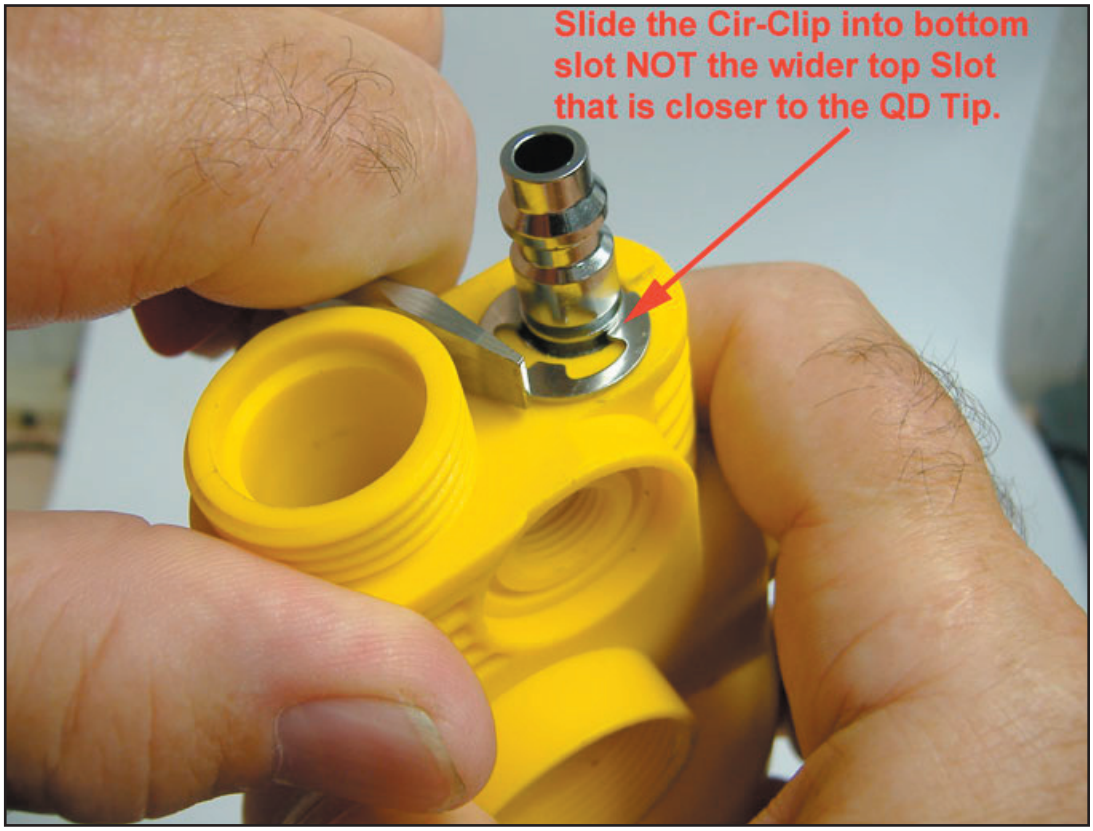


Photo 23

7.0.6 Install the QD Plug (7) onto the QD fitting. Use a flat bladed screwdriver to push the skirt of the Plug into the QD groove closest to the tip of the QD Fitting. (See Photo 24)

Photo 24

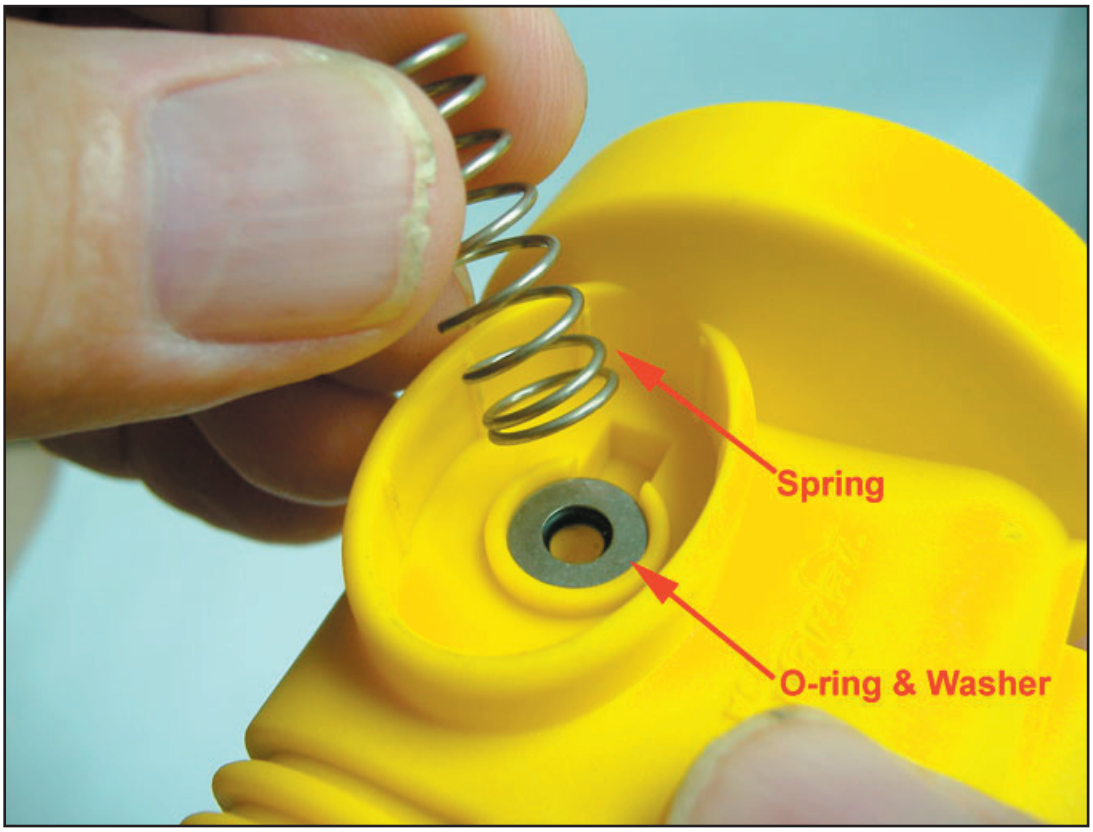
7.0.7 Before installing the Oval Deflate Button (3) into the body, it is important to understand that the shaft on the button assembly is not in the middle of the button. That means that sometimes the button will not fit properly into the hole in the Body. Photo 25 on the left shows the Button installed incorrectly. Photo 26 on the right, shows the button rotated 180 degrees and fitting correctly.

7.0.8 After seeing the two ways that the Button (3) can be oriented, remove it for a moment and install a new lubricated O-ring (27) from the Service Kit. (See Photo 27)

Photo 27

7.0.9 Install the Washer (28) and the Spring (26) on top of the O-ring. (See Photo 28)

Photo 28

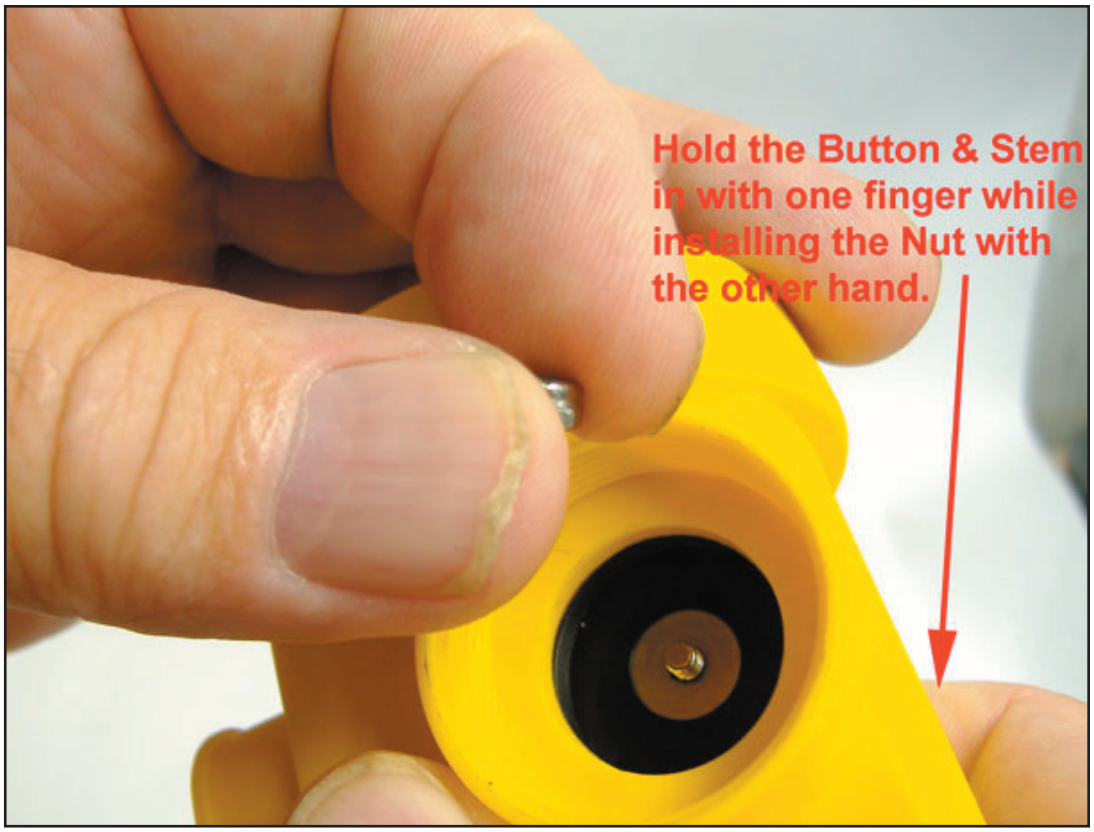


7.0.10 Install the Oval Button Assembly (3) properly oriented into the proper opening in the Body (25). Hold the Button, Spring, Washer and O-ring in place with one finger. Insert the Selector Valve (36) into the Body through the front opening. Be sure to orient the Selector Valve with the stainless steel washer facing up. (See Photo 29)

Photo 29

7.0.11 Use the finger on one hand to fully depress the Oval Button (3) so that the Button's Stem passes through the center of the Selector Valve (36) and the Selector Valve is pushed firmly against the Exhaust opening. Use the other hand to place the new self locking Nut (37) over the Stem's threads (See Photo 30)

Photo 30

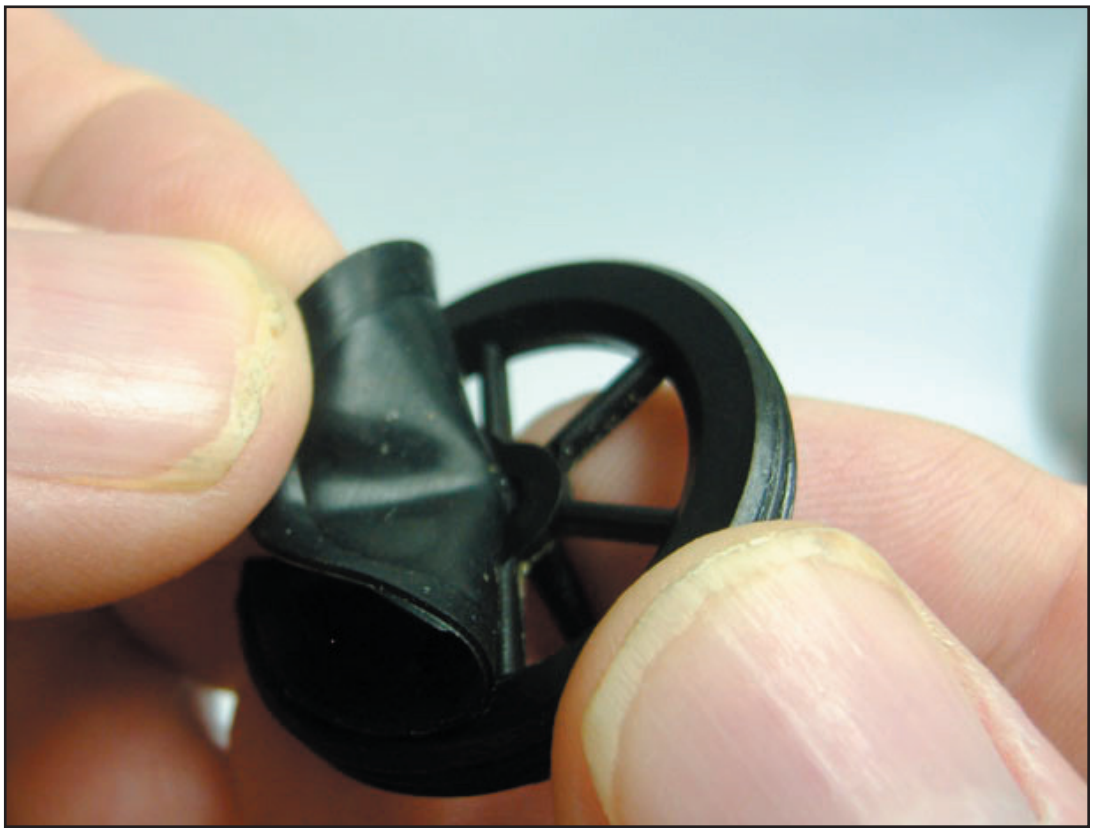


7.0.12 Use the 1/4" Nut Driver to tighten the locking Nut onto the Stem threads. Stop tightening the Nut as soon as you feel it bottom on the threads. (See Photo 31)

Photo 31

7.0.13 The Exhaust Valve (40) does not have to be removed from the exhaust Valve Support (39) unless an inspection of the valve shows tears or if the valve does not return to the closed position quickly when flipping it from edge to edge. If the Valve is found defective, it would be replaced at this time with a new one. (See Photo 32)

Photo 32



7.0.14 Install the lightly lubricated Flat Gasket (38) into the exhaust opening. (See Photo 33)

Photo 33

7.0.15 Install the Exhaust Valve Assembly into the exhaust opening of the Body (25). Position the Exhaust Valve Assembly with the nipple facing into the body. (See Photo 34)

Photo 34

7.0.16 When the Exhaust Valve Assembly touches the Flat Gasket (38) at the bottom of the exhaust opening, flip the Exhaust Valve (40) out of the way and use your fingers to tighten the Exhaust Valve Assembly about another 1/4 turn (See Photo 35)

Photo 35

7.0.17 Install the exhaust Valve Grate (41) on top of the Exhaust Valve Assembly. When you feel the exhaust Valve Grate touch the Exhaust Valve Assembly underneath, turn the exhaust Valve Grate about 1/4 more turn clockwise. (See Photo 36)

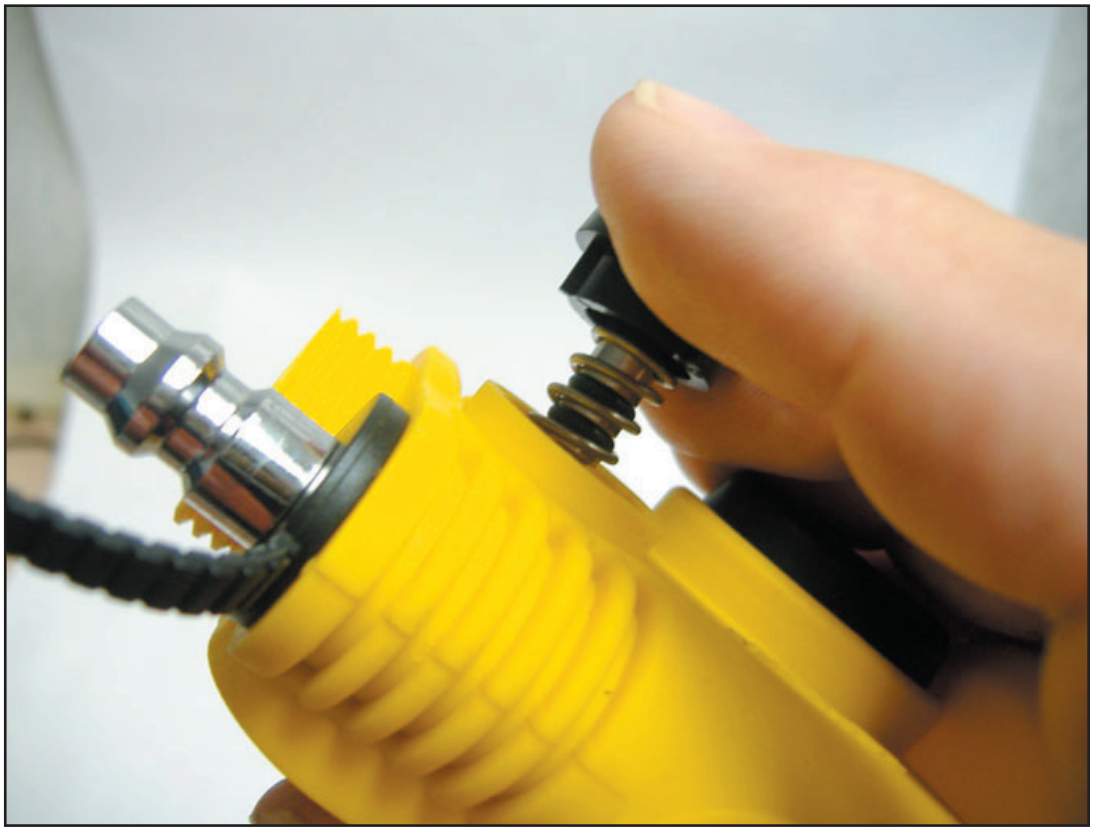
Photo 36

7.0.18 Install the new O-ring (30) from the Service Kit into the groove in the Body where the Inflate Cover (32) seals. Push the O-ring into the groove with your fingers until it fit properly and stays in place. (See Photo 37)

Photo 37

7.0.19 Install the two new O-rings (6) onto the stem of the Inflate Button (4). Insert the Inflate Button and Spring (5) into the proper opening in the Body (25). (See Photo 38)

Photo 38



7.0.20 Use the finger on one hand to fully depress the Round Button (4). Use the other hand to place the Sealing Nut (29) over the Stem's threads (See Photo 39)

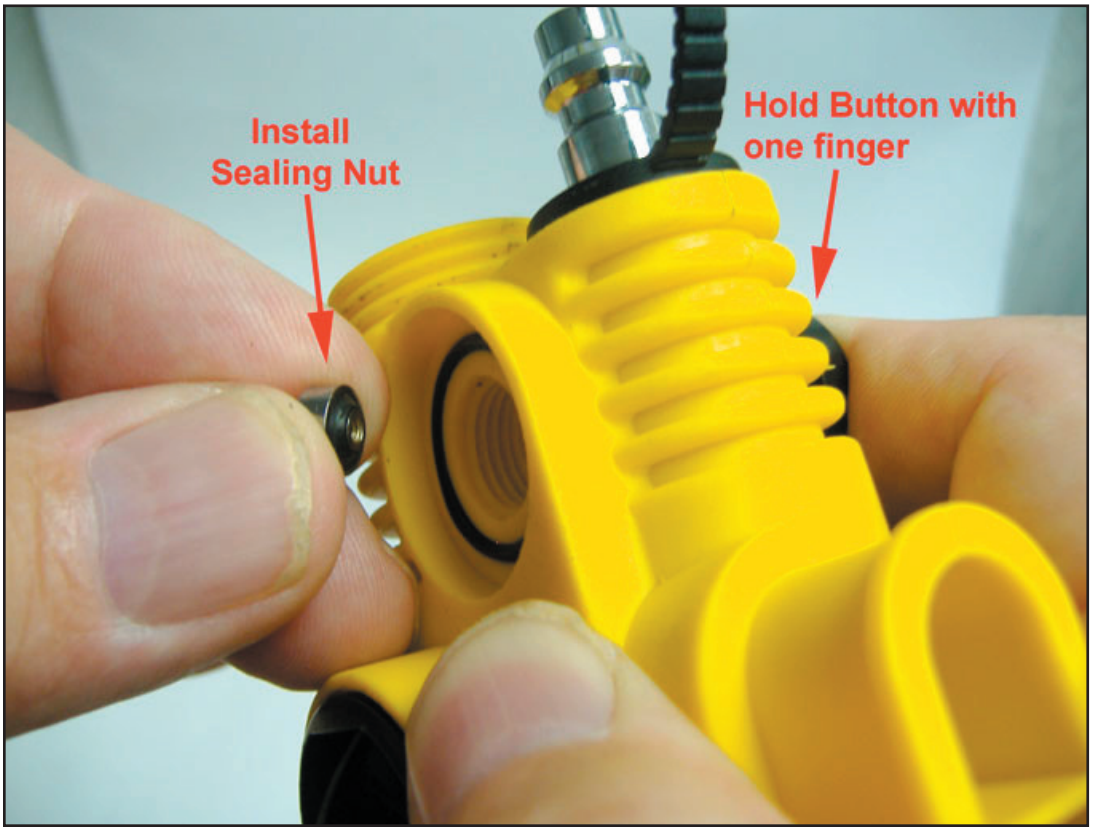


Photo 39

7.0.21 Use a flat bladed screwdriver to tighten the Sealing Nut onto the Stem threads. Stop tightening the Nut as soon as you feel it bottom on the threads. (See Photo 40)

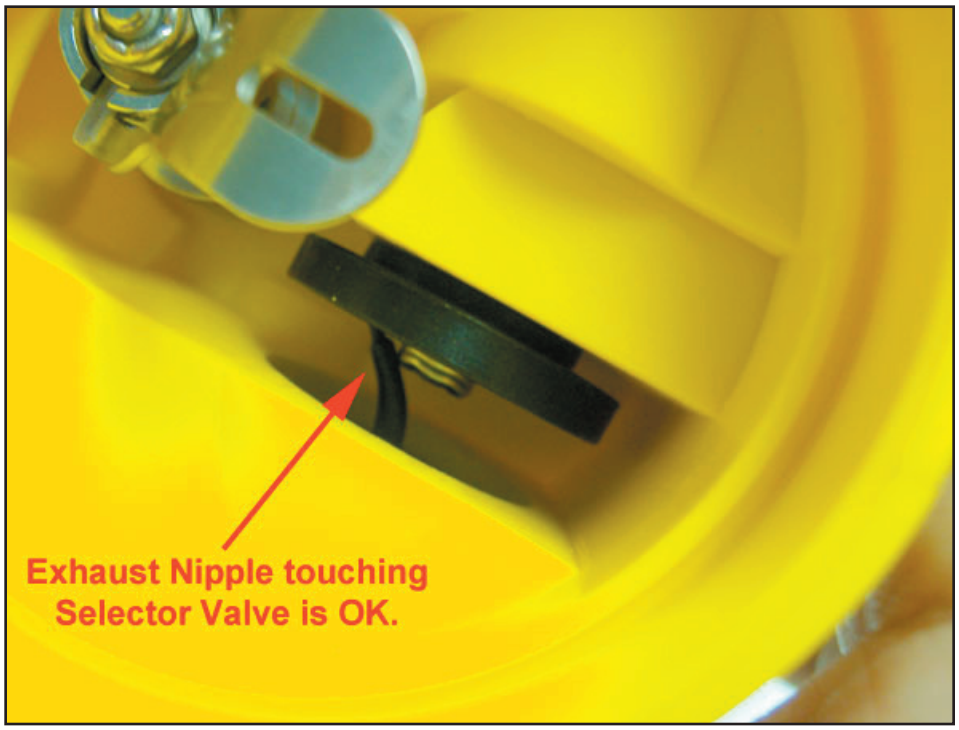
Photo 40

7.0.22 Install the Inflate Cover (32) into the opening and use a flat bladed screwdriver or coin to tighten it. The threads of the Cap and Body are indexed so that after you feel the Cap meet the body, you can tighten it a little more to line the ribs in the Cap with the ribs in the Body (See Photo 41)

Photo 41

7.0.23 When you look into the open end of the Octo-Z at this point, you may notice that the nipple from the Exhaust Valve (40) is bent and touching the Selector Valve (36) as it is depressed. This is normal. DO NOT CUT THE END OF THE NIPPLE! If you do, the stub of the Nipple will stick strait up, and then when you depress the Oval Button and move the Selector Valve, you will feel a great deal of resistance. The long Nipple makes it easier to remove and replace the Exhaust Valve if necessary. (See Photo 42)

Photo 42



7.2.0 SET- UP OF THE Octo-Z For the following adjustments, the cover and diaphragm must be removed.

7.2.1 Attach the Inflator Hose QD to the Octo-Z. (See Photo 43)

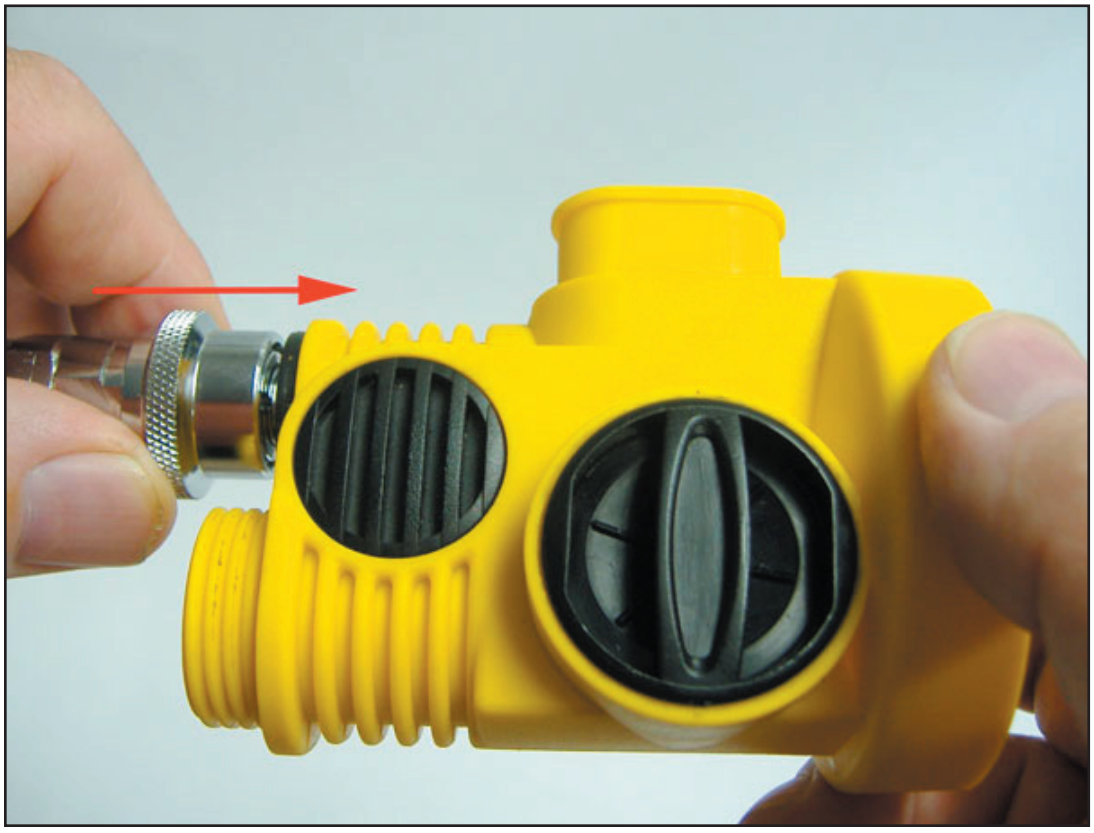


Photo 43

Note: Attach the Octo-Z Inflator Hose to a properly adjusted first stage that it is going to be used with, mounted on an air tank filled to between 2700 and 3500 psi. Install an intermediate pressure gauge into one of the low-pressure ports. **NEVER** tighten the inflator hose to the 1st stage with more than 40 in. lbs. (4.5 Nm) of torque. The inlet hose fitting can be weakened by over tightening.

7.2.2 Carefully turn the air on. Because you did not take apart the Lever Assembly or turn the Nut (18) at the end of the Poppet Stem, you do not have to do any adjusting to the Poppet Nut. All of the adjusting will be done by turning the Seat (14) with a 3/16" Hex Wrench. (See Photo 44). A properly adjusted Octo-Z will have about 1/16" to 1/8" (1.6 - 3.2 mm) of free play at the end of the lever when the regulator is pressurized. (See Photo 45) There should be no air leaking from the Octo-Z Lever Assembly with proper intermediate pressure applied to the hose.

Photo 44

Photo 45

7.2.3 If when the pressurized QD Hose is connected to the Octo-Z air is leaking from the Lever Assembly area, then the Seat (14) needs to be rotated Clockwise, to close the gap between the orifice in the Seat and the Seal (13) at the end of the Poppet (12).

7.2.4 If when the Octo-Z is pressurized no air flows from the Lever Assembly area, but the lever has too much loose movement (more than 1/8", 3.2 mm), then the Seat (14) needs to be rotated counter clockwise, to lessen the extra force between the orifice in the Seat and the Seal (13) at the end of the Poppet (12).

7.2.5 Each time an adjustment is needed, shut the tank air-valve off and purge the air from the Octo-Z. Then disconnect the Inflator Hose QD fitting from the Octo-Z so the 3/16" Allen Wrench can be inserted into the Seat so the Seat can be turned as required. Repeat these steps until the Lever (20) has the necessary free play at the tip of the Lever when the Octo-Z is pressurized. Once this proper free play is achieved, the Octo-Z is properly adjusted and it can be assembled the rest of the way.

7.2.6 If there is air leaking from anywhere on the Octo-Z, correct the problem before going further. The best test to check for the slightest leaks is to immerse the Octo-Z (with no cover or diaphragm installed) under pressure in water and look for bubbles at the Lever Support indicating a leak. Correct the problem if leaks are found. See the Troubleshooting section 9.0 D for suggestions.

7.2.7 Work the lever up and down a few times while the regulator is pressurized. Each time the lever is released, no air hissing should be heard.

Photo 46

7.2.8 Place the Diaphragm (35) carefully into the end of the Body. Make sure the outside skirt of the Diaphragm is properly seated into the groove in the Body. (See Photo 46)

Photo 46

7.2.9 Press the Purge Cover (34) FIRMLY over the Diaphragm (35) with a rocking motion. Push the Cover inwards from the left and right as well as the top and bottom. You will hear as clicking sound as the Cover moves down into position. When you do not hear anymore clicking sounds, the Cover is in place. (See Photo 46)

7.2.10 Install the Cover Ring (33) into the Body. Screw it into the Body by hand. Stop turning as soon as you feel it bottom in the Body.

Photo 47

7.2.11 Install the Mouthpiece onto the mouthtube on the Body. Install and tighten the plastic Tie (24) that came in the Service Kit. Cut off any excess tab sticking out of the Tie with side cutting pliers. (See Photo 48)

Photo 48

8.0.0 TESTING THE OCTO-Z AFTER REBUILDING

After completed the bi-annual overhaul of the Octo-Z, the testing needed is the same as that performed during the Visual Inspection procedure. Go to line 5.0.1 on page 7 of this manual, to read these steps.

9.0 TROUBLESHOOTING

A. HIGH INHALATION EFFORT AT SURFACE (cracking effort in air):

POSSIBLE CAUSE	RECOMMENDED ACTION
Inlet filter clogged.	Replace the 1st stage's filter.
Air supply to 1st stage insufficient.	Verify the supply air pressure. Make sure the customer had the air valve turned all the way on during the dive.
1st or 2nd stage improperly adjusted.	Refer to sections 4.5 and 5.5 of this manual.

B. LOW INHALATION EFFORT or AIR HISSING FROM LEVER SUPPORT ASSEMBLY:

POSSIBLE CAUSE	RECOMMENDED ACTION
1st or Octo-Z Stage adjusted improperly	Refer to section 7.2 of this manual for the Octo-Z and also look at the 1st Stage Regulator's Service Manual for the set up of the 1st Stage.
2nd stage spring force at or below low end of range	The spring (23) can be conditioned to a higher thrust. This is done by stretching it slightly with your fingers. Note: This will raise the cracking effort in air, but will have little or no effect on the underwater performance. Remember that it is preferable for an Octopus regulator to have a higher cracking effort than a primary regulator. This is because the Octo-Z is not in the diver's mouth during high currents and entries and airflow can be initiated accidentally. A high cracking effort will shut this unwanted airflow off again. If the hissing does not stop, the seat (14) needs adjusting, or the seal (13) needs replacing.

C. CREEPING INTERMEDIATE PRESSURE (a 1st Stage Problem):

POSSIBLE CAUSE	RECOMMENDED ACTION
Damaged or worn 1st stage seat.	Replace seat
Damaged or worn seat O-ring	Replace O-ring
Worn O-ring on HP valve stem.	Replace O-ring
Scratch in groove where O-ring seals	Replace HP balance plug
Nick in sealing surface of HP valve	Replace HP valve

D. HISSING FROM Octo-Z (but 1st Stage intermediate pressure is OK):

POSSIBLE CAUSE	RECOMMENDED ACTION
Damaged or worn 2nd stage seating seal (13)	Replace seating seal
Nicked seat (14) sealing surfaces	Replace seat
Seat (14) out of adjustment	Adjust Seat
Worn O-ring (15) on Seat (14)	Replace O-ring
Damaged O-ring groove on Seat (14)	Replace Seat
Spring (23) thrust too weak	Stretch Spring
Air is escaping past Sealing Nut (29) (filling BC)	Replace Sealing Nut (29)

E. WET BREATHING:

POSSIBLE CAUSE	RECOMMENDED ACTION
Diaphragm improperly installed or hole in diaphragm	Check position of diaphragm visually. Replace if holes found by holding up to a light.
Damaged or loose fitting exhaust valve	Replace exhaust valve (40)
Crack in housing (25)	Replace housing
Kinked Flat Gasket (38)	Re-position or Replace Flat Gasket (38)
Scratched or worn housing (25) sealing surfaces	Replace Housing (25)
Improper clearing techniques by diver	Instruct diver on clearing techniques
Extremely slow or upsidedown breathing, allowing water to build up in housing rather than being blown out	Explain this result of upsidedown or slow breathing to diver.

F. HIGH FREQUENCY HUMMING OR BUZZING DURING INHALATION (1st stage issue):

POSSIBLE CAUSE	RECOMMENDED ACTION
Harmonic resonance between the springs and other 1st stage components.	Remove the main spring flip it over and re-install.
" "	Replace spring or other components until resonance stops.

G. LOW FREQUENCY FLUTTERING DURING INHALATION (Above the surface only):

POSSIBLE CAUSE	RECOMMENDED ACTION
Harmonic resonance between the springs and other 2nd stage components.	Remove, rotate and re-install diaphragm or switch diaphragm with another.
" "	Replace seating seal (13)
" "	Remove, rotate and re-install spring (23)
" "	Explain to the customer that this is not harmful to the regulator, and does not happen underwater.

10.0 PARTS CLEANING RECOMMENDATIONS

10.0.1 Regulators that see heavy use, particularly those used in salt water, often require extra effort to remove dirt and corrosion from the parts of the regulator. Some suggested cleaning solutions are listed at the end of this section, and there are probably many others being used successfully. The following are a few general suggestions we can make.

10.0.2 Don't expect your cleaning solution to do all the work in a matter of seconds. If the solution cleans extremely rapidly, it is probably too strong and is etching the finish on the parts. Use a wooden or plastic stick or a soft bristle brush to help get rid of the thickest deposits. Take special care not to damage orifice sealing areas.

10.0.3 Soft parts absorb ultrasonic energy. Remove all O-rings and seals from metal parts before cleaning them. If possible, do not clean plastic parts with the metal parts, or at least understand that every plastic part you put into the ultrasonic cleaner is slowing down the ultrasonic cleaning process for the rest of the parts.

10.1 COMMONLY USED CLEANING SOLUTIONS

SOLUTION	COMMENTS
Hot Soapy water	Preferable. Good for plastic, silicone and plated metal parts.
Vinegar and water (equal part solution) (weaker solution in Ultrasonic Cleaner)	Ingredients easily available. Approx. 15 min. cleaning time. May damage chrome finish. Never use on plastic parts. Vinegar dissolves the plastics in most polymers making them brittle and more prone to breakage.
Simple Green ® and Water	Simple Green® is a readily available degreaser. Read the product label for mixing ratios with water.
Cleaning solutions recommended by ultrasonic cleaner manufacturers	The preferred choice. Check with the manufacturer for strengths and recommended uses for their cleaners. Choose soap solutions over acidic ones.

10.2 HANDLING TIPS

How your customers treat their regulators will directly influence the unit's function and durability. Following are a few tips that you can pass on to your customers to help assure the durability of their Zeagle Scuba Regulator.

11.0 PRE-DIVE CHECKS:

11.0.1 Check the hoses and hose connections for cuts, abrasions or other signs of damage before mounting the regulator on the tank valve. Slide the hose protectors back to inspect the areas of the hose normally covered. Be sure all hose connections are tight. With the Octo-Z, check that the Bx Connection between the Corrugated Hose and the Octo-Z is tight.

11.0.2 Just before mounting the regulator on the valve, always turn the valve on briefly to blow any trapped water out of the valve. There is often salty water trapped in the outlet side of the valve. This entrapped salt water being blown through the interior of the regulator is the number one source of internal corrosion and problems with Scuba regulators.

11.0.3 Before turning on the tank air valve, check to make sure that the yoke nut or DIN connection is tight and the regulator body is aligned properly, with no kinks in the hoses.

11.0.4 Turn the tank valve on slowly and listen for leaks. If any leaks are found, replace or repair parts as recommended.

11.0.5 Never lift the tank/BCD assembly by the regulator or hoses.

11.0.6 Surface-test the regulator by breathing lightly through the mouthpiece. Depressing the purge button above the water's surface is not an effective or thorough method for testing the function of the regulator.

12.0 POST-DIVE CARE:

12.0.1 Disconnect the Octo-Z from the Corrugated BC hose, but leave it attached to the QD Inflator Hose. With a fresh water hose or tank, flush fresh water through the mouthpiece and out the exhaust. After rinsing, with the air turned on, press the Inflate button and the Purge Button to force clean dry air through the Octo-Z to dry it. Put Octo-Z into dive bag still attached to the 1st stage.

12.0.2 Blow all water out of the dust cap with clean dry air or dab the water out with an absorbent cloth and place the cap securely on the regulator inlet. On multiple tank dives, use great care to keep salt water out of the regulator inlet when tanks are changed. Neglecting these simple procedures is another great cause of corrosion and wear in Scuba regulators. Zeagle's Dry Seal System keeps all other water-borne contamination out of the first stage body.

12.0.3 With the dust cap securely in place, rinse the first and second stages in clean fresh water. DO NOT depress the purge button before or during rinsing since this may introduce water into the second stage and the low-pressure hose. Shake or blow all excess water from the second stage and allow the entire regulator to air-dry before storing.

12.0.4 Store regulator in a clean bag or storage box, away from sunlight, excessive heat and humidity.

13.0 WARRANTY AND MAINTENANCE INFORMATION

13.1 PROPER PROCEDURE FOR SERVICE PAPERWORK (USA)

13.1.1 Make sure your service location has an adequate supply of the three part "Zeagle Service Order / Parts Request" forms. One of these carbon-paper forms is required to get credit for parts used in any warranty replacement. Contact Zeagle Customer Service for replacement forms.

13.1.2 When the regulator is received from the customer for servicing, verify that they are the original retail owner of the regulator and that they have had the regulator serviced annually at an Authorized Zeagle Dealer. You can use your records for this, or receipts they have. If they are not the original owner or have not had the regulator serviced annually, the warranty is no longer in effect.

13.1.3 Fill out the Zeagle Service Order / Parts Request form. PRINT CLEARLY! If you use service kits, you only have to use the service kit part number(s) to represent all of the parts in that kit. Parts other than those in the kits have to be listed individually. The reason for replacing the part also has to be listed on the form.

13.1.4 Attach all of the old parts that were replaced under warranty in a plastic bag and attach it to the Zeagle Service Order / Parts Request form.

13.1.5 If a body or housing is replaced, the replacement parts may have different new serial numbers. Note the new serial # in “Description of Part” section of the Zeagle Service Order / Parts Request form. Write the old number in the Serial # section. The dive store and the customer should keep records of this serial number change. Use the new numbers in future warranty claims. You can also contact Zeagle to have the customer’s original serial number applied to replacement bodies.

13.1.6 Contact Zeagle Customer Service and ask for an RA (Return Authorization) number for each group of Zeagle Service Order / Parts Request forms you are going to send in. YOU MUST GET A RA# BEFORE RETURNING ANY PARTS TO ZEAGLE. Due to high volume and a desire to move promised items through the service department quickly, boxes arriving without a RA# will be put at the end of the line and will be opened when all other work on properly RA numbered items is finished. This could delay your items by weeks during peak season!

13.1.7 Write the RA number on the Zeagle Service Order / Parts Request form. Mail the forms with attached parts bags to Zeagle. You will receive credit or replacement parts ONLY if an RA number is printed on the form.

13.1.8 If you are servicing Zeagle regulators outside of the United States, your return procedures may be different. Check with your regional Zeagle Distributor for details.

13.2 SCHEDULED MAINTENANCE

13.2.1 To keep the Octo-Z warranty in effect, your customers must have their Octo-Zs visually inspected the first year and fully overhauled the second year, alternating after that (within six weeks before or after the anniversary of the date of purchase) by an authorized Zeagle Dealer. Failure to do so invalidates the warranty.

13.2.2 Even with infrequent use, the regulator should be inspected or overhauled annually to ensure proper performance and satisfy warranty requirements.

13.2.3 After calling Zeagle Customer Service at (813) 782-5568 for an RA number, Zeagle Scuba parts and warranty forms are sent to the following address:

RA # (fill your RA # in here)
37150 Chancey Road
Zephyrhills, Florida 33541
U. S. A.

14.0 Order Form (sample)

This is a copy of the Service Parts Request Form. The actual form is a three-page carbon copy that is available by request from Zeagle Customer Service. If you do not have any forms on hand, you may photocopy this page and use it to receive warranty parts credit.

Service Order / Parts Request Form

zeagle® SYSTEMS, INC.

This form must be used by the Service Center for ANY Warranty Servicing

You MUST contact Zeagle for an RA Number to receive any Warranty Credit

37150 Chancey Rd.
Zephyrhills, FL 33541
(813) 782-5568
Fax (813) 782-5569
www.zeagle.com

Zeagle Service Center:
City, State (Prov), Country:
Phone / E-mail:

Date Serviced: Technician Name (PRINT):
Technician Number:

Customer Name:
Address:
City, State (Prov), Country:
Phone / E-mail:

RA # (call Zeagle): _____
1st Stage Model: _____ Serial #: _____
2nd Stage Model: _____ Serial #: _____
Octopus Model: _____ Serial #: _____

Comments:

Part # Installed	Description of Part	Warranty Item? Y/N	Customer Price
345-1000	First Stage Service Kit		
345-2000	Second Stage Service Kit		
345-7000	Octo-Z bi-annual Service Kit		
Note: If a body or housing is replaced, note the new serial # in “Description of Part”			Total:

I am the original (first) owner of this equipment being serviced. Yes ____ No _____

Customer’s Signature: _____ Date: _____

The customer must provide proof of original ownership (receipts, etc.) before any “in Warranty” service can be performed.
Service Center: Be sure this form is completely filled out, signed by the customer and returned to Zeagle for credit on warranty parts.

37150 Chancey Road
Zephyrhills, Florida 33541
U. S. A.

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Zeagle Web Site www.zeagle.com
E-mail all technical questions to Zeagle at tech@zeagle.com
Phone (813) 872-5568, Fax (813) 782-5569

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